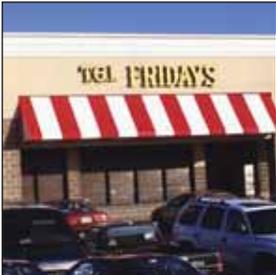


# CONTENTS



## Consumer-Driven Agriculture

### **2 America's Changing Appetite: Food Consumption and Spending to 2020**

—Noel Blisard, Biing-Hwan Lin, John Cromartie, and Nicole Ballenger

### **10 Population Growth and Demographic Change, 1980-2020**

—John Cromartie

### **13 New Health Information Is Reshaping Food Choices**

—Jayachandran N. Variyam and Elise Golan

### **19 Changing Consumer Demands Create Opportunities for U.S. Food System**

—David E. Davis and Hayden Stewart

### **24 Food Product Introductions Continue To Decline in 2000**

—J. Michael Harris

### **28 Innovation by Food Companies Key to Growth and Profitability**

—Hayden Stewart and Steve Martinez

### **33 Farm Business Practices Coordinate Production With Consumer Preferences**

—Steve Martinez and David E. Davis

### **39 U.S. Food Sector Linked to Global Consumers**

—Anita Regmi and Greg Pompelli

## Also Inside

### **45 Food Assistance Expenditures Increase in 2001**

—Victor Oliveira

### **51 ERS Releases New Report, *Household Food Security in the United States, 2000***

# America's Changing Appetite: Food Consumption and Spending to 2020

Noel Blisard, Biing-Hwan Lin, John Cromartie, and Nicole Ballenger

America's appetite, like its population, is always changing. Foods once favored are now rarely eaten. Foods once only dreamed about are a reality. Dining out, once thought to be a luxury, is now common. The Nation's population is wealthier, older, more educated, and more ethnically diverse than in the past. And these demographic changes are likely to become more pronounced in the next 20 years. Consumers will continue to demand new food products, new packaging, more convenience, new delivery systems, and safer and more nutritious foods. Consequently, USDA's Economic Research Service (ERS) has undertaken an extensive effort to project how population growth, an aging population, ethnic diversity, other demographic trends, and income growth will affect future food choices and how the food system will respond to such changes.

By 2020, the U.S. population will add between 50 and 80 million people—all becoming part of the food system. Based on an increase of 50 million food customers, U.S. food expenditures are projected to rise 26 percent between 2000 and 2020. With food spending already approaching \$800 billion in 2001, the projected increase will boost food sales of supermarkets, restaurants, fast food outlets, and other retail food establishments by \$208 billion.

Increased food spending driven by population growth is just one way consumers will shape the future of the U.S. food system. Our research is also designed to understand how shifts in the demographic profile of the projected U.S. population in 2020 will affect what people will eat and how much they will spend, where people will eat, and what product characteristics will command the consumer's food dollar. These future food choices will have implications for the organizational structure of the food industry and for the economic well-being of farmers, food processors, retailers, and other participants in the food production and marketing system—our concept of “consumer-driven agriculture.”

## Models and Assumptions of Our Analysis

ERS's consumer-driven agriculture project involved separate but coordinated econometric model-based projections of per capita food expenditures and per capita demand for food quantities. The first step was to estimate the effects of a range of demographic variables and assumed income growth on per capita food expenditures and food quantities consumed. The demographic variables included region of country, race or ethnic composition, household type (for example, single adult with children, or dual-headed household), education level of household head, age distribution of household members, and an index variable designed to capture diet and health knowledge of the household head. The expenditure analysis was based on data from the Bureau of Labor Statistics'

Consumer Expenditure Survey (CES), while the food quantity analysis was based on data from USDA's Continuing Survey of Food Intakes by Individuals (CSFII) (see box).

The second step was to convert the results into projections for 2020 based on projected changes in the demographic variables over the next two decades and assumptions about income growth. We assume that the U.S. population will grow from 281.4 million in 2000 to 331.9 million in 2020. Over the same period, the proportions of Blacks, Asians, and, especially, Hispanics will increase in relation to the proportion of Whites (see “Population Growth and Demographic Change, 1980-2020” elsewhere in this issue). The regional population distribution, expressed as shares of total U.S. population, will also change. The Northeast will decline from 19 percent of the population in 2000 to 17.4 percent in 2020. Likewise, the North Central will decline from 22.9 percent in 2000 to 21.1 percent in 2020. Over the same period, the South will increase from 35.6 to 36.3 percent, while the West will increase from 22.5 to 25.2 percent.

Lastly, age distribution, expressed as a share of the total population, will change between 2000 and 2020. The proportion of the population age 20-29 will decline from 13.5 to 13.3 percent, while the proportion of the population age 30-44 will decline from 23.5 to 19.2 percent. At the same time, the proportion of the population age 45-64 will increase from 22.0 to 24.6 percent, while the proportion of the population age 65-74 will increase

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Income growth, rather than shifting demographics, will be the primary influence behind increases in per capita food expenditures.

Credit: Eyewire.

from 6.5 to 9.6 percent. Likewise, the population over age 74 will increase from 5.9 percent of the total population in 2000 to 6.9 percent in 2020.

Our analysis conservatively assumes that real per capita income—income adjusted for inflation and taxes—will grow at 1 percent annually between 2000 and 2020. This growth level compares with an observed average increase of 1.8 percent per year during 1978-88 and 1.2 percent annually during 1988-98.

Before presenting some of our results, it is appropriate to mention two limitations when such analysis is used for projection purposes. First, there is an implicit assumption that as any individual moves from one demographic group to another, his or her preferences immediately take on the characteristics of the new group. In other words, a 70-year-old person in 2020 is expected to have the same consumption pattern as a 70-year-old in 2000 with similar characteristics.

Second, the analysis is based on a cross-section of data collected over a short period of time. As such, we assume that relative prices are the same for all households. Thus, the observed consumption behavior is for a fixed set of food and nonfood prices. As supply and demand conditions change over time, relative prices will change and the consumption patterns suggested here could be quite different.

### Shifts in Age Distribution Dominate Demographic Effects

Table 1 contains the projected changes in per capita food expenditures between 2000 and 2020 due to projected changes in the household age distribution, the regional distribution of the population, the racial distribution, and the assumed income growth, all other variables held constant. The combined, or net, effect of changes in these variables is labeled “net.” The results indicate that changes in age distribution will have a bigger ef-

fect on per capita food expenditures than changes in region of residence or race, including both the level of per capita expenditures and the pattern of a person’s expenditures among different food groups.

The shift toward an older age distribution, all other variables held constant, is projected to increase per capita food expenditures just 1 percent over the 20-year period. This effect can be divided into spending on food at home and away from home. Per capita spending on away-from-home food (food purchased from a restaurant, sandwich shop, or other foodservice establishment) will actually decline by 1 percent due to the aging of the population, other variables held constant, because older people tend to eat away from home less frequently than younger people. However, expenditures on at-home food (food purchased from a grocery store, supermarket, or other retailer) will increase over 2 percent by 2020. Interestingly, the expenditure model results suggest that regional

## Surveys Look at Expenditures and Consumption

The U.S. Department of Labor's Bureau of Labor Statistics has conducted the annual Consumer Expenditure Survey (CES) since 1980. This survey provides a rich source of information on the spending patterns of American households. The CES is composed of two components, each with its own questionnaire and sample. The first component is an interview panel survey in which approximately 5,000 households are surveyed every 3 months over a 1-year period. The interview survey obtains data on large and infrequently purchased items, such as property, automobiles, and major appliances, as well as those which occur on a regular basis, such as rent, utilities, and insurance premiums. The second component is a diary survey of approximately the same sample size in which households keep an expenditure diary for 2 consecutive weeks. The diary survey obtains data on small, frequently purchased items that are normally difficult to recall. These items include food and beverages, tobacco, housekeeping supplies, nonprescription drugs, and personal care products and services. We used data from the diary survey in our analysis.

Household food expenditures in the CES are reported in two broad categories: at home and away from home. Away-from-home food expenditures are reported as breakfast, lunch, dinner, or snack, and by type of eating establishment. At-home food expenditures are reported for specific foods, such as beef, pork, and milk. We aggregated the at-home data into 14 categories.

Since the 1930s, USDA has conducted food-consumption surveys on a national scale in 1936, 1942, 1948 (urban only), 1955, 1965-66, 1977-78, 1987-88, 1989-91, and 1994-96. The survey data have been used to describe U.S. food-consumption patterns and to assess the nutritional contents of Americans' diets. The most recent survey—Continuing Survey of Food Intakes by Individuals (CSFII), 1994-96—uses 24-hour recalls to collect information on what, when, where, and how much 15,303 individuals ate and drank over 2 nonconsecutive days. Because each of the 7,300 food items in the CSFII is reported individually, CSFII data can be aggregated into various food groups for at-home and away-from-home food consumption. We modeled at-home and away-from-home food consumption in 2020 separately and then added the two categories together to project total food consumption in 2020.

population distribution changes and racial distribution changes will have virtually no effect on per capita food expenditures over the next 20 years.

Under the at-home food category, the shift toward an older age distribution has the most effect on expenditures in the food categories of fruits (up 3.7 percent), vegetables (up 3.6 percent), and fish and pork (both up 3.1 percent). This finding reflects current tendencies of older age groups to eat more of these foods than younger segments of the population. At-home food categories with the smallest projected effects on expenditures are poultry (up just 0.1 percent) and beverages (up 0.4 percent).

Changes in age distribution will also have a significant effect on per capita quantities consumed (table 2). In general, as adults age, they tend to eat less. The quantity model suggests the largest consumption declines will be fried potatoes (down 5.8 percent), cheese (down 2.7 percent), and sugar (down 1.6 percent). The shift in age distribution, all other variables held constant, is also likely to put downward pressure on per capita quantities consumed of beef and poultry. On the other hand, the age distribution effect is likely to result in an increase in per capita consumption of "other potatoes" (up 3.2 percent), "other fruits" (up 2.0 percent), fish (up 1.8 percent), and eggs (up 1.5 percent).

### Growing Ethnic Diversity Has Mixed Implications for Consumption

The United States—always a nation of immigrants—today receives twice as many newcomers each year as any other country. The current high tide of immigration began with new laws in the mid-1960s that opened entry to relatives of U.S. residents and tilted the preference system toward countries outside Europe. Immigration now accounts for one-third or more of annual U.S. population growth, and those entering the country are

more culturally diverse than in previous times.

Future immigration levels are difficult to predict because they are determined largely by Federal policy. However, it is easy to believe high immigration will continue, given large world population growth and the increased demand for U.S. workers as the baby boom generation nears retirement age—now less than 10 years away. If immigration follows the pattern used by the Census Bureau to project the U.S. population, the U.S. foreign-born population will rise from 28 to 38 million by 2020.

Over the next two decades, the U.S. Hispanic population is expected to grow by 1.2 million annually, compared with annual increases of 500,000 for non-Hispanic Whites and 400,000 each for Blacks and Asians. Population growth among Whites, Blacks, and Native Americans will come largely from natural increase (births minus deaths), while growth among the Hispanic and Asian populations will come from a combination of natural increase and immigration.

The shift in racial and ethnic composition of the U.S. population will effect some changes, though minor, in per capita quantities consumed between 2000 and 2020. Based on current consumption patterns, the increasing diversity of the population is likely to increase per capita consumption of fruits, nuts and seeds, eggs, poultry, and fish, all other variables held constant. Growing ethnic diversity, particularly increases in the Hispanic population, is expected to decrease per capita consumption of dairy products unless tastes and preferences of these population groups change to embrace dairy as a more integral component of their diets.

The largest per capita increase in consumption resulting from the shift in racial composition will occur in citrus fruits (up 2.5 percent), while the largest decrease will occur in "other potatoes" (down 2.2 percent). The model results suggest that growth in U.S. ethnic pop-

**Table 1—Per Capita Expenditures on Fruits and Vegetables Will Have Highest Increases as U.S. Population Ages, 2000-20**

Food group	Per capita effects on food expenditures				Net	Total effect of income, demographics, and population growth
	Age distribution	Regional distribution	Racial composition	Income growth		
<i>Percent</i>						
Total food	1.0	0	-.01	6.2	7.1	26.3
Away from home	-1.0	0	-.02	9.7	8.1	27.5
At home	2.2	0	-.01	3.0	5.4	24.3
Cereals and bakery products	2.0	0	.00	2.4	4.3	23.0
Meats, poultry, fish, and eggs	2.5	0	.01	1.3	4.1	22.8
Beef	2.1	0	.00	.1	2.6	21.1
Pork	3.1	0	.00	.1	3.8	22.5
Poultry	.1	0	.00	1.6	3.4	21.9
Fish	3.1	0	.00	1.9	6.2	25.2
Dairy	1.3	0	.00	2.6	4.0	22.6
Fruits	3.7	0	.00	4.2	8.1	27.5
Vegetables	3.6	0	.00	3.3	7.2	26.5
Sugars and sweets	2.4	0	.00	2.3	4.7	23.5
Beverages	.4	0	.00	2.6	2.7	21.1
Fats and oils	2.9	0	.00	.1	4.3	23.1
Miscellaneous prepared foods	1.1	0	-.03	3.8	5.3	24.2

Note: Net effect is the combination of age, region, race, and income changes. Total effect is the net effect multiplied by changes in the U.S. population.

Source: USDA's Economic Research Service.

ulations will increase per capita beef consumption, but increase fish and poultry consumption even more. (Race's effect on beef consumption contrasts with that of age, which tends to decrease per capita beef consumption.) All of these results depend on the assumption that the immigrant-based populations in 2020 will have similar eating preferences to immigrant-based populations today.

Shifts in the regional distribution of the U.S. population, all other variables held constant, will have a slight negative effect on per capita food consumption. Most changes will be well under 1 percent.

### Income Is the Most Important Driver of Per Capita Food Expenditures

Our analysis shows that projected income growth overshadows projected shifts in demographic characteristics, such as age, race, and region, as an influence on food expenditures (table 1). Income growth will also drive up future per capita food expenditures more rap-

idly than it will increase per capita quantities consumed for virtually all foods. The reason is simple: Americans are already well off and well fed. Consumers will spend extra discretionary income on quality and convenience, rather than quantity.

Our analysis also indicates that income growth will spur faster growth in per capita expenditures on dining out than in per capita expenditures on food for at-home preparation and consumption. By 2020, away-from-home food expenditures are expected to increase almost 10 percent on a per capita basis due to income growth alone, whereas at-home food expenditures are expected to increase just 3 percent due to income growth. Forces shaping preferences for where and what to eat are complex and uncertain. Away-from-home food consumption should increase due to the increase in per capita income and the continuing shift to smaller households, including more "empty-nester" and single-person households. Yet, these increases could be offset by the aging U.S. population

and the rise in the proportion of ethnic groups, particularly Hispanics and Asians, who tend to dine out less than Whites of similar means and family size. These proclivities for dining at home could change, however, as the eating preferences of new and recent U.S. immigrants evolve with their immersion in the U.S. culture and economy.

By 2020, per capita expenditures for at-home food influenced by income growth will likely shift somewhat in favor of fruits (up 4.2

**As the U.S. ethnic population continues to grow, supermarkets and food retailers will likely increase product offerings tailored to appeal to the preferences of their diverse customer base.**

**Credit: Ken Hammond, USDA.**



percent), miscellaneous prepared foods (up 3.8 percent), and vegetables (up 3.3 percent). Other changes in per capita food expenditures due to income growth are positive, but smaller in magnitude.

Income growth is also likely to result in some shifts in per capita quantities consumed. Higher incomes, all other variables held constant, are likely to boost the consumption of fruits and vegetables (except potatoes), cheese and yogurt, and fish, while lowering the consumption of pork, beef, other meat, and eggs (table 2). These shifts are expected to be small, rel-

ative to the shifts for expenditures, and are based on differences in current consumption patterns that we observe today among income groups.

### Educational Attainment Enhances Dietary Knowledge

Increases in education level reinforce the shifts in consumption expected to occur with income growth. The 2020 U.S. population will achieve higher levels of formal education, with 86 percent of the population having a high school degree and 26 percent finishing college, versus 83 and 23 percent, re-

spectively, in 2000. More years of schooling enhances consumer awareness and knowledge of diet and health issues, which favors consumption of some foods over others (see “New Health Information Is Reshaping Food Choices” elsewhere in this issue).

The effect of increased education levels is projected to increase consumption of fruits and vegetables, except fried potatoes (table 2). On the other hand, the projected rise in education levels is expected to have a small, negative effect on per capita consumption of beef, pork, other meats, and eggs.

**Table 2—Growth in the Amount We Eat Will Be Less Than What We Spend, 2000-20**

Commodity	Per capita effects on quantities consumed						Net	Total effect of income, demographics, and population growth
	Age distribution	Regional distribution	Racial composition	Household type composition	Education distribution	Income growth		
	<i>Percent</i>							
<b>Meats:</b>								
Beef	-1.36	-.06	.58	-.58	-.48	-.67	-2.80	14.65
Pork	.09	-.50	-.09	-.42	-.67	-1.17	-3.07	14.33
Poultry	-1.26	-.21	1.29	-.21	.03	.50	.38	18.41
Fish	1.76	.30	2.17	.66	.26	1.11	6.58	25.71
Other meat	-1.01	-.30	-.81	-.36	-.54	-.79	-3.76	13.52
Eggs	1.48	.12	1.75	-.28	-.67	-1.89	.33	18.35
<b>Dairy:</b>								
Milk	-.73	-.05	-1.19	.05	.54	-.15	-1.19	16.54
Cheese	-2.73	-.01	-1.38	-.08	.83	1.67	-1.44	16.26
Yogurt	.40	-.18	-1.56	.50	1.04	1.39	2.08	20.41
Vegetable oils	-.78	.00	-.19	.21	.29	.77	.40	18.42
<b>Fruit</b>								
Citrus	.48	-.62	2.48	.60	2.13	1.87	7.40	26.68
Apples	.95	-.55	2.42	.47	2.14	1.93	7.84	27.20
Grapes	.59	-.45	1.35	.31	1.69	1.23	5.13	24.00
Other fruit	1.96	.06	1.33	.06	1.61	1.48	7.00	26.21
Nuts and seeds	.18	.42	1.67	-.05	.47	.42	2.94	21.43
<b>Vegetables</b>								
Fried potatoes	-5.76	.06	-1.72	-.21	-.82	.19	-8.60	7.81
Other potatoes	3.18	-.76	-2.19	-.94	.12	-1.86	-2.97	14.45
Tomatoes	-.75	.11	.88	-.10	.18	.86	1.25	19.43
Lettuce	.68	.10	.37	.84	.71	2.12	5.09	23.96
Other vegetables	1.34	-.04	.54	.41	.57	.65	3.61	22.21
Grains	-.74	-.04	.88	.16	.45	.63	1.49	19.72
Sugar	-1.58	-.06	-.81	.04	.24	.34	-1.68	15.98

Note: Net effect is the combination of age, region, race, income, household type, and education. Total effect is the net effect multiplied by changes in the U.S. population.

Source: USDA's Economic Research Service.

## Income and Demographic Effects Boost Fruit, Vegetable, and Fish Consumption

By combining the projected demographic shifts with an assumed annual increase in real income of 1 percent, we can determine how both per capita food expenditures and per capita consumption will change between 2000 and 2020. Per capita food expenditures will increase 7.1 percent (table 1). Away-from-home food expenditures will increase more, 8.1 percent, while at-home food expenditures will increase 5.4 percent.

The largest increases for per capita expenditures on at-home food are anticipated for fruits (up 8.1 percent), vegetables (up 7.2 percent), fish (up 6.2 percent), miscellaneous prepared foods (up 5.3 percent) and sugars and sweets (up 4.7 percent). The largest increases for per capita quantities consumed are expected for fruits, with apples, citrus, and other fruit increasing 7 percent or more (table 2). Per capita vegetable consumption will also increase, with the exceptions being fried potatoes (down 8.6 percent) and other potatoes (down 3.0 percent). Decreases are expected in per capita consumption of beef (down 2.8 percent) and pork (down 3 percent), but per capita consumption of fish is expected to increase (up 6.5 percent).

## Population Growth Drives Total Food Demand

The most important factor behind the growth in total food demand is the expansion of the U.S. population. To derive the “total effect” of U.S. population growth on food demand, we multiplied the net projected per capita expenditures and quantities consumed in tables 1 and 2 by the assumed increase of 50 million people by 2020.

Total food expenditures are projected to increase 26.3 percent by 2020. Away-from-home food expenditures are projected to increase 27.5 percent, compared with 24.3 percent for at-home food expenditures. Because the individual food



groups in table 1 represent at-home food expenditures only, projected expenditures understate total food expenditure growth for the individual food groups to the extent that the away-from-home market grows for particular foods.

One effect of the slow but steady growth of the population is that there is little variation on a national level among expenditure growth levels of food groups. The largest projected increase is for fruits, up 27.5 percent, while the smallest is for both beef and beverages, up 21.1 percent.

Slightly more variation exists among quantities consumed. For example, while consumption of beef and pork is expected to increase by 14.7 and 14.3 percent, respectively, fruit consumption will increase 24-27 percent, depending on the type of fruit. The smallest projected increase is for fried potatoes (up 7.8 percent), and the largest increase is for apples (up 27.2 percent).

## Tomorrow's Food Consumer Will Demand More Quality, Not More Quantity

The effect of demographic and income changes on demand for food can be separated into two components—demand for quantity and demand for quality. The demand for quantity typically describes the

demand for undifferentiated basic commodities, while the demand for quality describes the demand for a wide array of food characteristics, such as taste, nutritional content, safety, and convenience.

Increased demand for quality can be manifested through purchases of higher valued items within a food group or through purchases of new food types. For example, within the red meat food group, more affluent consumers may choose steaks instead of hamburgers. More affluent consumers may also expand their food choices to include luxury items, such as lobster or truffles, or new convenience foods, including away-from-home foods. Consumers may also increase their demand for processed foods that meet particular safety requirements, such as pasteurized eggs, or foods with preferred nutrition attributes, such as leaner meats. Food expenditures may also increase if food choices begin to reflect more complex desires, such as “fair-trading” practices, environmental protection, or animal welfare, if these desires add to the cost of producing or marketing foods, and thereby increase retail prices. Previous studies have found that as U.S. incomes rise, consumers increase their expenditures on more expensive fresh foods, more pro-

**Fruit consumption is likely to increase due to changes in U.S. demographics, such as increased education levels and an older age distribution.**

**Credit: PhotoDisc.**

cessed food, and more dining away from home.

Our analysis supports the hypothesis that consumers may demand quality over quantity, especially as real incomes increase. Among the major food groups, the net effect of income growth and demographic change is projected to have its largest percentage effect on per capita expenditures for fruits, vegetables, and miscellaneous prepared foods—a category that captures a vast array of processed foods.

Consumption and expenditure projections for beef provide a striking illustration of quality versus quantity. In 2020, the U.S. popula-

tion is projected to consume about 15 percent more beef (in quantity terms) than in 2000. This increase is driven almost entirely by population growth but is supported by a slight increase in the proportion of beef eaten away from home.

Several factors put slight downward pressure on per capita beef consumption, including the aging population, educational attainment (which heightens awareness of the health risks of excess saturated fat), and income growth (which the model suggests favors a shift toward poultry and fish and away from beef and pork). In fact, because of these effects, per capita beef consumption is projected to be

about 3 percent lower in 2020 than in 2000 and just 3 percent higher in per capita expenditures over the same time period.

Nonetheless, total U.S. expenditures for beef are expected to increase 21 percent by 2020. The gap between the projected increase (21 percent) in total expenditures for beef and the projected increase (15 percent) in total consumption of beef can be explained by a shift in consumption toward a higher quality, more expensive product. Quality may include better cuts or more expensive grinds of beef, restaurant grade beef, and semi-prepared (such as pre-marinated and dressed) fresh beef meals offered by some supermarkets.

### Will Americans in 2020 Prefer To Eat at Home or Away From Home?

Over the past 30 years, eating out has become increasingly popular for Americans. A number of factors contribute to the trend of increased dining out, including a growing number of women employed outside the home, more two-earner households, higher incomes, and the smaller size of American households. However, the aging of the U.S. population raises questions about the future of eating at home versus eating away from home. As noted earlier, the age effect (isolated from other effects) will actually decrease per capita expenditures on away-from-home food 1 percent, while raising per capita expenditures on at-home food over 2 percent. Aging, therefore, is projected to slow the trend toward increased importance of away-from-home foods in the American diet. This finding assumes, however, that seniors (those age 65 and older) in 2020 will mimic the eating habits of seniors today.

Rising incomes and population growth are expected to continue to fuel the growth of the away-from-home market. Our analysis indicates the growth in at-home and away-from-home markets will vary by commodity, in terms of total quantity consumed (table 3). We

**Table 3—Away-From-Home Food Markets Will Grow Faster Than At-Home Food Markets, 2000-20**

Commodity	Market growth: 2000-20		Commodity market share			
	At home	Away from home	2000		2020	
			At home	Away from home	At home	Away from home
	<i>Percent</i>					
Meats:						
Beef	13	19	67	33	65	35
Pork	13	21	79	21	77	23
Poultry	19	18	68	32	69	31
Fish	23	30	66	34	64	36
Other meat	13	18	77	23	76	24
Eggs	17	23	78	22	77	23
Dairy:						
Milk	17	18	87	13	87	13
Cheese	18	18	63	37	63	37
Yogurt	18	0	97	3	97	3
Vegetable oils	18	20	68	32	67	33
Fruit:						
Citrus	28	20	89	11	90	10
Apples	28	20	91	9	92	8
Grapes	24	20	91	9	91	9
Other fruit	27	22	90	10	90	10
Nuts and seeds	21	24	80	20	80	20
Vegetables:						
Fried potatoes	5	10	49	51	48	52
Other potatoes	13	20	82	18	82	18
Tomatoes	19	20	76	24	76	24
Lettuce	22	26	57	43	56	44
Other vegetables	21	26	80	20	80	20
Grains	19	22	77	23	77	23
Sugar	16	17	77	23	77	23

Source: USDA's Economic Research Service.

expect the growth in the away-from-home market to continue outpacing the growth in the at-home market for meats (except poultry), eggs, vegetables, and grains. For example, the away-from-home market for fish is expected to grow 30 percent, compared with 23-percent growth for the at-home fish market. However, we expect the at-home consumption of fruits to rise faster than away-from-home consumption of fruits.

The differing growth rates for the at-home and away-from-home markets would affect their shares of the total commodity market. Over the next two decades, we expect the away-from-home market share to rise for beef, pork, fish, other meats, eggs, fried potatoes, and lettuce. However, the at-home market share of fruit would rise.

### **A Well-Off and Ethnically Diverse Nation Will Demand Variety**

Immigrants from Asia, Africa, and Latin America are causing widespread increases in food choices offered in American supermarkets and restaurants. The variety of foods in the American marketplace is likely to continue to grow as the U.S. ethnic population grows from 28 percent of the population in 2000 to 36 percent in 2020.

Increases in income, especially when coupled with exposure to new and different foods, will also stimulate Americans' continuing quest for increased variety in their diets. As income rises and the consumption of any one good increases, the pleasure that the consumer derives from that good decreases (a process called "diminishing marginal utility" by economists). For example, the enjoyment of eating the tenth "crispy on the outside, creamy on the inside" donut does not match that of eating the first. As a result, other goods become relatively more desirable and the variety of foods consumed increases. Indeed, the most successful food companies in 2020 are likely to be those that tap most effectively into Americans' ap-



preciation for diversity in their lives, especially the possibly insatiable desire for new and different food choices.

Total food expenditures by the U.S. population are projected to increase 26 percent between 2000 and 2020, driven mainly by population growth. Projected higher incomes will reinforce Americans' tendency to eat more meals away from home, although the larger numbers of seniors and recent immigrants may work against this trend. Higher incomes, higher education levels, and an aging population will all reinforce recent shifts in the composition of Americans' increasingly varied diets toward more fruits, vegetables, and fish. Expected increases in per capita income and, to a lesser extent, the aging population will contribute to a 7-percent increase in per capita expenditures for food as well. However, the effects of higher per capita incomes will be largely realized in the form of increased demand for quality, convenience, and variety, rather than quantity

The anticipation that increases in income are likely to have a larger impact on demand for quality and variety than on demand for quantity has two important implications for agriculture. First, growth in demand for value-added

food products will increase the share of every food dollar that goes to processors and retailers, diminishing still further the value of the basic commodity as an input in the final product. This trend also has ramifications for the food processing and retailing industries (see "Innovation by Food Companies Key to Growth and Profitability" elsewhere in this issue). If expenditures on prepared foods and away-from-home foods continue to grow, the food system will become more service oriented—a development that would echo trends in the general economy.

Second, with increased demand for variety and quality-differentiated products come new markets for high quality or specialty crops, such as tofu-grade soybeans and vine-ripened tomatoes. These new markets can open up opportunities for farmers (see "Farm Business Practices Coordinate Production With Consumer Preferences" elsewhere in this issue). Market differentiation also provides opportunities to better price discriminate, that is, to tailor products and prices to the differing demands and pocketbooks of subgroups of buyers. Farmers thereby earn higher profits than possible in undifferentiated product, uniform-price markets. **FR**

**The expansion of the U.S. population—50 million people will be added to the food system by 2020—is the most important factor behind the growth in total food demand.**

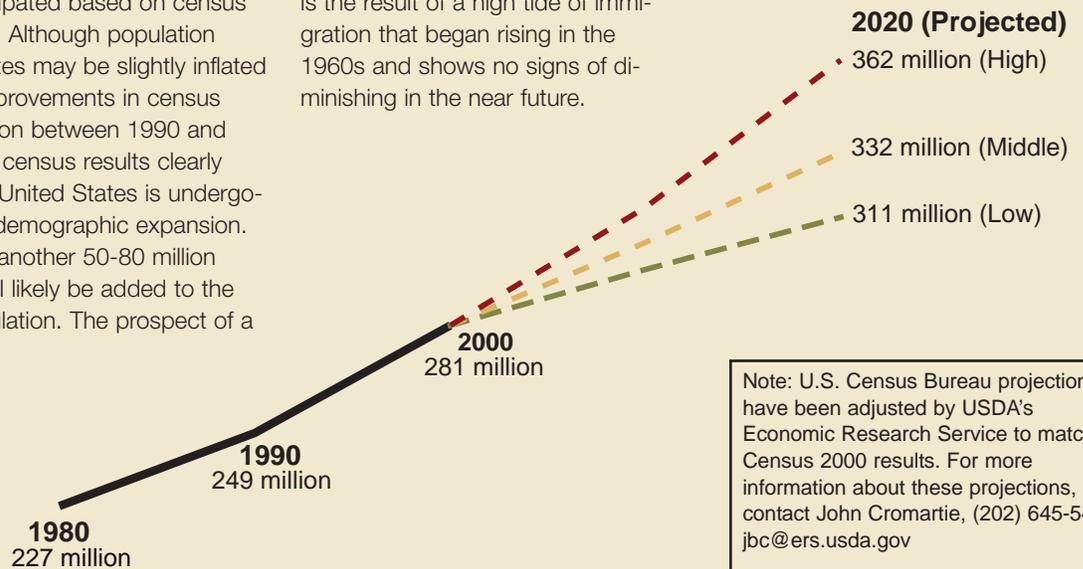
**Credit: EyeWire.**

# Population Growth and Demographic Change, 1980-2020

**Figure 1—U.S. Population May Top 350 Million in 20 Years**

Census 2000 counted 281 million Americans, 54 million more than in 1980 and 7 million more than anticipated based on census estimates. Although population growth rates may be slightly inflated due to improvements in census enumeration between 1990 and 2000, the census results clearly show the United States is undergoing rapid demographic expansion. By 2020, another 50-80 million people will likely be added to the U.S. population. The prospect of a

dynamic demographic future, setting apart the United States from most other industrialized countries, is the result of a high tide of immigration that began rising in the 1960s and shows no signs of diminishing in the near future.



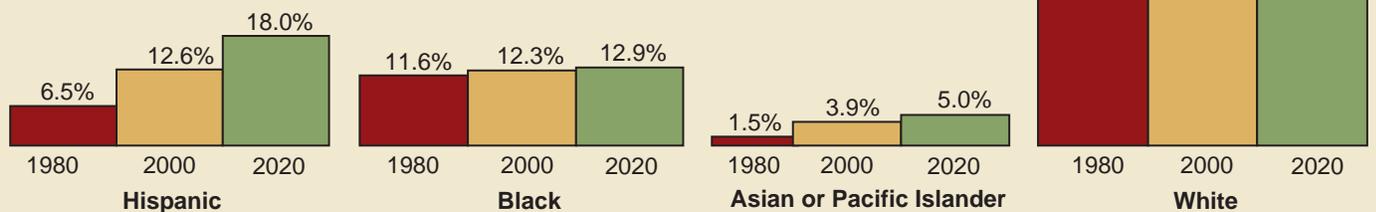
Note: U.S. Census Bureau projections have been adjusted by USDA's Economic Research Service to match Census 2000 results. For more information about these projections, contact John Cromartie, (202) 645-5421, [jbc@ers.usda.gov](mailto:jbc@ers.usda.gov)

**Figure 2—Hispanics Are Fastest Growing Segment of the U.S. Population**

The growing diversity of U.S. food choices is likely to echo the growing diversity of the U.S. population. Over the next two decades, the Hispanic population is expected to grow by 1.2 million annually, compared with annual growth of 500,000 among non-Hispanic Whites and 400,000 each among Blacks and Asians. Growth among

Whites, Blacks, and Native Americans comes largely from natural increase (births minus deaths), while growth among the Hispanic and Asian populations comes from a combination of natural increase and immigration. Higher birth, death, and immigration rates all contribute to a younger age structure among minority populations and, consequent-

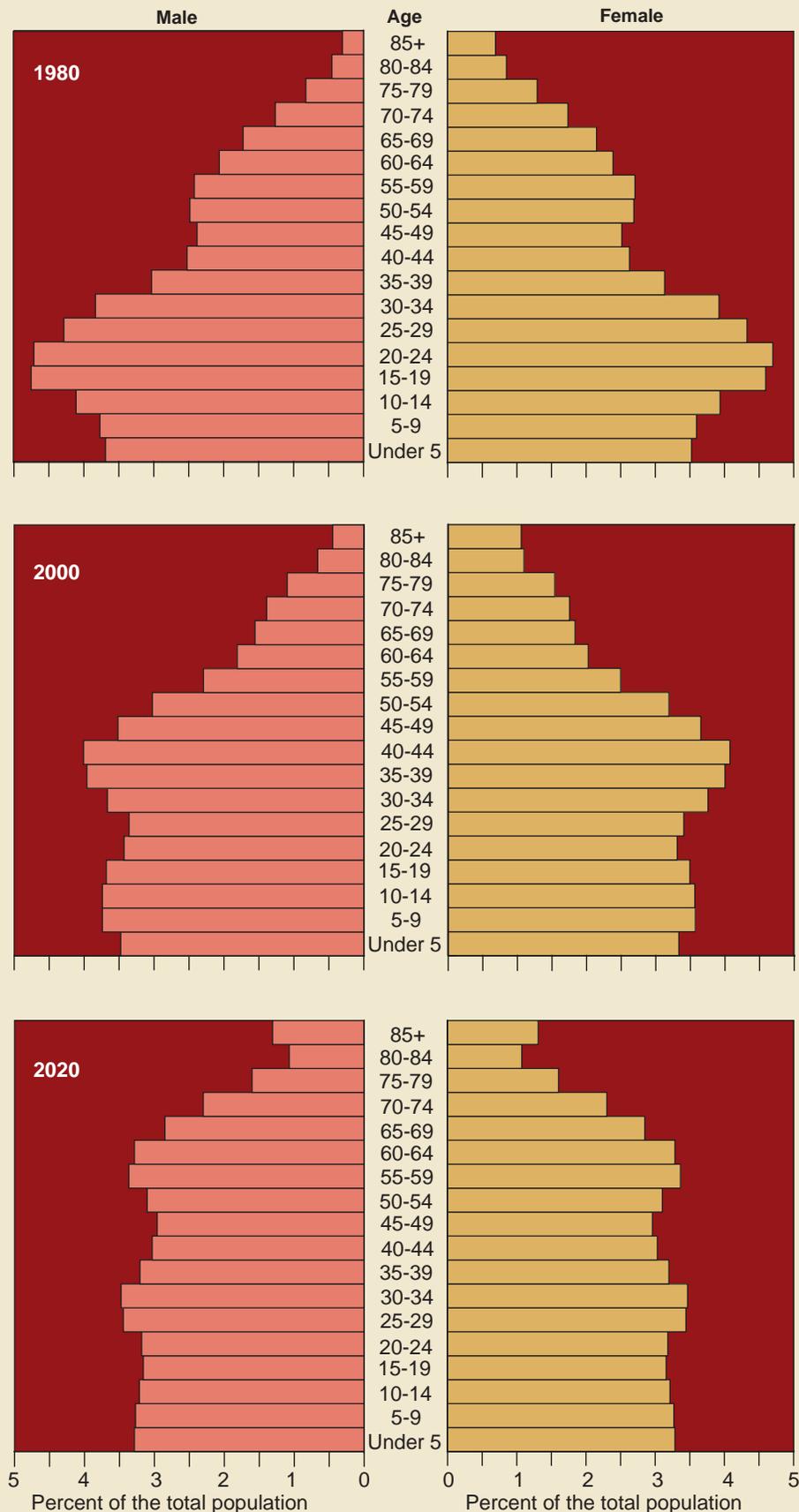
ly, a built-in growth momentum, as a higher proportion of the minority population will be in its childbearing years. Currently, the median age of non-Hispanic Whites is 38.1, compared with 26.5 for Hispanics and 30.3 for Blacks. Only one-fourth of Whites are under age 18, compared with one-third of minorities.



**Figure 3—Baby Boom Generation Hits Retirement Age**

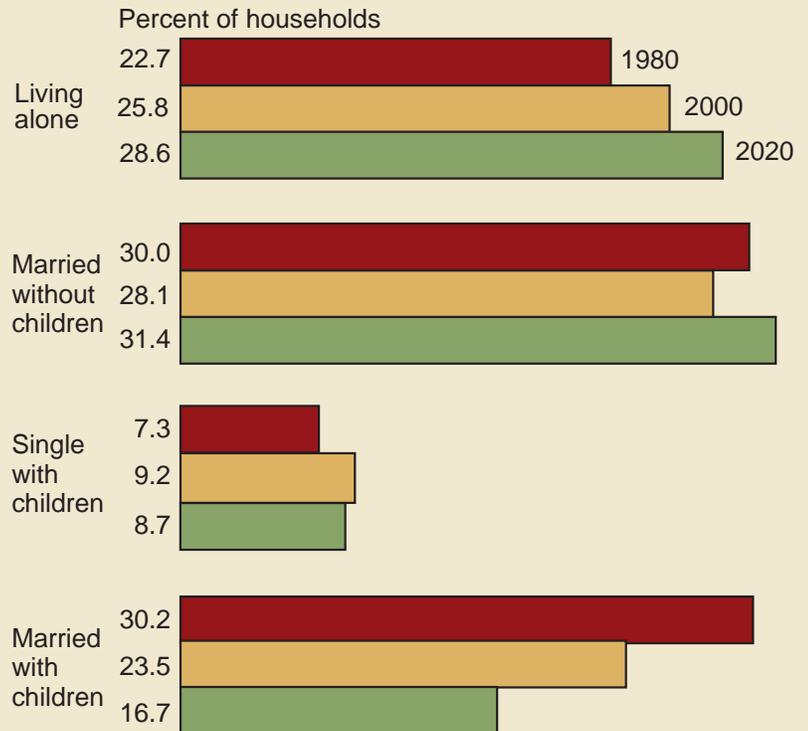
The growth of America's older population will rank among the most far-reaching and challenging developments of the next two decades and beyond. The remarkable increase in life expectancy during the 20th century, from 47 to 77 years on average at birth, laid the groundwork for an older society. Average life expectancy in the United States is predicted to rise another 2 years by 2020. However, the coming retirement-age boom has less to do with further breakthroughs in health and medicine and more to do with the baby boom, the rapid rise in fertility levels following World War II that briefly interrupted the long-term decline in childbearing among American women. With the aging of the baby boom generation, whose members currently range in age from 37 to 55, the number of Americans older than age 65 will jump from 35 million in 2000 to 54 million in 2020. Without another baby boom, the U.S. population under age 18 will increase by 7 million by 2020 but decline as a share of the total.

The age profile in the United States is shifting from an unequal distribution dominated by the baby boom bulge and younger age groups toward an older age structure and a more even balance among age groups. As the baby boom generation crosses the retirement-age threshold, most of the growth among older Americans will be among the relatively more vigorous "young-old" population up through 2020. The number of people age 65 to 74 will increase from 6 to 10 percent of the population by 2020, while those age 75 and older will increase from 6 to 7 percent.



**Figure 4—As U.S. Population Ages, Shares of Empty Nesters and Persons Living Alone Increase**

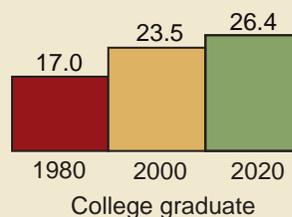
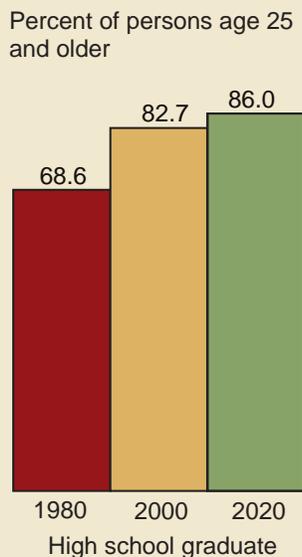
The rate of household formation in the United States has exceeded population growth for decades, resulting in a steady decrease in average household size. Although the pace of household formation has slowed since the 1970s when baby boomers first entered the housing market and did so in record numbers, average household size has continued to fall, from 2.8 persons in 1980 to around 2.5 persons in 2000. During this period, the share of U.S. households consisting of a married couple with children dropped from 30 to 24 percent, while the share of single-person households rose from 23 to 26 percent. Average household size will continue shrinking over the next two decades, dropping below 2.4 persons by 2020 as the number of "empty-nest" households rises from 28 to 31 percent. The aging of the U.S. population will also contribute to a higher proportion of single-person households.



**Figure 5—U.S. Adult Population Continues Long-Term Upward Trend in Educational Attainment**

Educational progress in the United States has been one of the demographic hallmarks of this past century, as the share of the population completing high school rose from 40 to 83 percent and the share graduating from college rose from 10 to 24 percent. Average educational attainment has advanced over the past several decades, in part, because older, less-educated generations

have been replaced by more-educated younger generations. The education gap between generations has begun to close, but will remain large enough to continue to raise average educational attainment for the next two decades. According to Jennifer Day and Kurt Bauman of the U.S. Census Bureau, it is also reasonable to assume that college attendance will continue to rise, especially among females, and that overall education levels among the rapidly increasing foreign-born population will rise toward the higher levels seen in native-born population groups of the same race and ethnic background. Thus, by 2020, a projected 86 percent of the U.S. population will have a high school degree and 26 percent will have finished college.



# New Health Information Is Reshaping Food Choices

Jayachandran N. Variyam and Elise Golan

Over the past half century, consumption patterns of many food commodities have shifted dramatically in the face of changing consumer demand. For example, until the early 1950s, eggs were a staple of the American diet, especially at the breakfast table. Since then, however, egg consumption has steadily dropped. Per capita egg consumption in the United States fell from 390 in 1950 to 233 in 1991, the lowest level ever recorded. Today, annual egg consumption stands at about 250 eggs per person.

While other commodities have undergone similar drops in consumption, some have enjoyed booming demand. For example, consumption of whole milk has declined over the past 60 years, while consumption of reduced-fat milk has risen more than threefold. Similarly, the consumption of red meats (beef, veal, pork, and lamb) has declined since the late 1970s, while poultry consumption has shown a continuing upward trend, replacing red meats as the meat of choice in the late 1990s. During this same period, the use of butter and lard has declined, replaced largely by the increased use of salad and cooking oils.

What accounts for such shifts in food consumption patterns? While changes in relative prices and income levels are responsible for much of the shift, there is an additional and increasingly important factor at play—the growing scientific evidence linking health to diet. Many consumers have modified their food choices in reaction to the flood of diet and health information coming out of the Nation's labora-

tories and research institutions. This article examines how health information is reshaping consumer food preferences and the Nation's food and agricultural sectors.

## Evidence Linking Diet and Health Is Growing...

Nutrition research in the first half of the 20th century focused on identification and prevention of nutrient-deficiency diseases. In the second half of the century, the focus of research shifted to the role of diet in maintaining health and reducing risk of chronic diseases, such as heart disease and cancer. Concerns about dietary inadequacy were largely replaced by concerns about overconsumption of fats, cholesterol, and calories. The first scientific accounts of the link between diet and heart disease began to appear in the early 1960s. Since then, evidence associating specific foods and dietary components with specific health outcomes has expanded

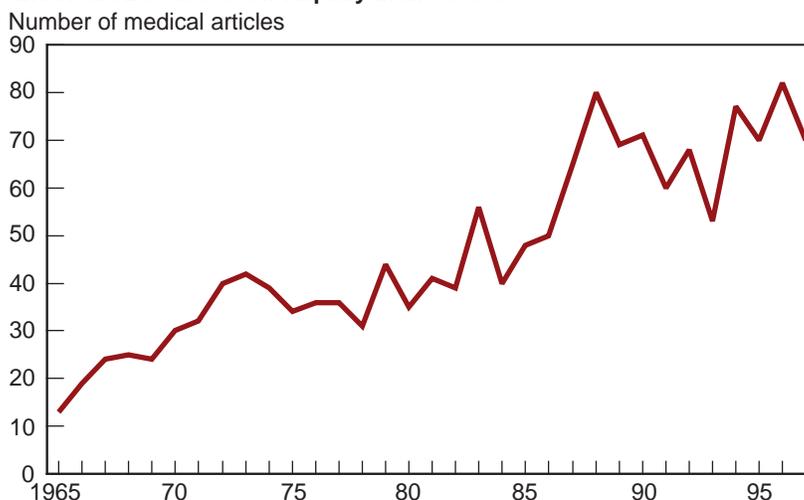
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rapidly. For example, data collected through MEDLINE, a database containing the abstracts of all articles published in medical journals worldwide, show that the annual number of English-language articles linking fats and cholesterol to heart disease grew from 13 in 1965 to 82 in 1996 (fig. 1). By 1997, a cumulative total of 1,543 published scientific studies had linked fat and cholesterol to the increased risk of heart disease.

Since the earliest studies linking diet and health, nutrition research has expanded in many directions. The wide range of diet and health linkages examined include those between metabolism and hormonal regulation, neuro-

**Figure 1—Number of Studies Linking Dietary Lipids, Blood Cholesterol, and Heart Disease Grew Rapidly in the 1980s**



Source: Chern and Zuo (1997).

science and nutrition, genetic makeup and nutrition, and nutrition and immunology.

### ...and So Is the Amount of Diet and Health Information Available to Consumers

As advances in scientific understanding of the link between diet and health are translated into practical advice regarding food choices and diet, this advice is disseminated to consumers. Aside from word of mouth and personal physicians, there are at least four major sources of information on diet and health for the consumer: government education programs, nutrition facts labels, product health claims, and the popular media.

*Government education programs.* In 1977, the Senate Select Committee on Nutrition and Human Needs released *Dietary Goals for the United States*. This study shifted the focus of Federal dietary guidance from obtaining adequate nutrients to avoiding excessive intakes of nutrients linked to chronic illnesses. Soon after, USDA released the *Hassle-Free Guide to a Better Diet*. In 1980, USDA and the U.S. Department of Health and Human Services (DHHS) issued the first edition of the *Dietary Guidelines for Americans*. The first *Guidelines* recommended consumption of a variety of foods to provide essential nutrients, as well as moderate consumption of certain dietary constituents, such as fat, saturated fat, cholesterol, and sodium. Since 1980, the *Dietary Guidelines* have been revised every 5 years to reflect changes and advances in scientific knowledge. The *Guidelines* have been complemented by other educational campaigns, such as the National Cancer Institute's 5-a-Day for Better Health campaign (1991) and the USDA/DHHS Food Guide Pyramid (1992). Other efforts, such as the National High Blood Pressure Education Program (1981) and the National Cholesterol Education Program (1984), are also targeted at increasing public awareness of

the relationship between diet and disease.

*Nutrition facts labels.* Since implementation of the Nutrition Labeling and Education Act (NLEA) in 1994, the U.S. Food and Drug Administration (FDA) has required the inclusion of nutrition information on most packaged foods. The NLEA gives consumers a powerful source of information on health and nutrition. Through nutrition labeling, consumers have ready access to information on product content, nutrient content, and contribution toward a 2000-calorie diet.

*Product health claims.* Manufacturers may include product health claims, which are monitored by either FDA or USDA, on their product labels or in their advertising. Nutritional claims provide consumers with information about the link between diet and health. For example, oat products labeled "heart-healthy" help to inform consumers about the benefits of diets high in dietary fiber. The number of products with nutritional claims has grown significantly in the past two decades (see "Food Product Introductions Continue to Decline in 2000" elsewhere in this issue). For example, in 1995, in anticipation of increased demand due to consumer awareness of the link between fat consumption and heart disease, producers introduced nearly 2,000 new food products with reduced- or low-fat claims.

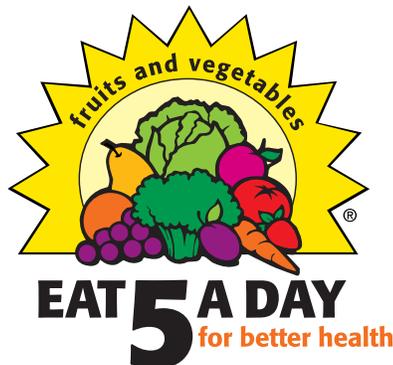
*Popular media.* The popular media has always taken note of America's fascination with diet and health. As early as the 19th century, the publishing industry was producing diet-advice books, such as

the popular *How to be Plump*. By midcentury, the press had become adept at expeditious dissemination of nutrition information. For example, the articles "Are You Eating Your Way to a Heart Attack?" (*Saturday Evening Post*, December 1, 1956) and "Fat, Food, and Heart Disease" (*Consumer Reports*, August 1962) contained newly issued information on research linking heart disease and diet. Currently, information on the link between diet and health is readily available in newspapers, magazines, and books, as well as via radio and television shows. A September 2001 search of recent publications on [www.amazon.com](http://www.amazon.com) found 16,563 matches with the term "diet."

### Health Information Influences Food Choices

Information is a powerful influence on food choices. Evidence of this claim is revealed by the amount of resources dedicated to generating such information—including the large advertising budgets of food manufacturers. In 2000, U.S. food producers spent \$26 billion on advertising. To better understand the role that the influx of diet and health information plays in changing food consumption patterns, economists have developed statistical models to examine the joint influence of prices, rising or falling incomes, and diet and health information on consumer food demand.

In one study, Purdue University economists Deborah Brown and Lee Schrader developed a cholesterol information index based on the number of articles on the link between cholesterol and heart disease that were published in scientific journals quarterly between 1955 and 1987. The economists used this index to examine the relationship between the decline in egg consumption and the increase in health information about cholesterol. After accounting for the effects of changes in egg price, price of meat (a substitute for eggs), per capita income, and the percentage of women in the labor force, Brown



and Schrader found that, between 1955 and 1987, the increase in information on the links between cholesterol and heart disease resulted in decreased per capita consumption of shell eggs by 16-25 percent.

A study by Texas A&M University economists Oral Capps and John Schmitz strengthened the claim that health information is a contributing influence to changes in food consumption patterns. Capps and Schmitz used the cholesterol information index to show the relationship between increasing health information and the demand for beef, pork, poultry, and fish. The economists used a model that took into account the effect of relative prices of the four foods and per capita income as well. The study showed that, between 1966 and 1988, health information increases led to decreased consumption of pork and increased consumption of poultry and fish. The effect on beef consumption, though negative, was not conclusive.

Ohio State University food economists used an updated version of the cholesterol information index to examine the influence of health information on the demand for various food commodities. In one study, Wen Chern and Jun Zuo examined the changing demand for whole milk versus low-fat milk. They found that a 10-percent increase in fat and cholesterol information resulted in an 8-percent decline in the proportion of households purchasing whole milk and a 4-percent increase in the proportion of households purchasing low-fat milk. Because the decrease in whole milk purchases is not fully offset by the increase in low-fat milk purchases, total milk consumption tended to decline with more information on the health effects of fats and cholesterol.

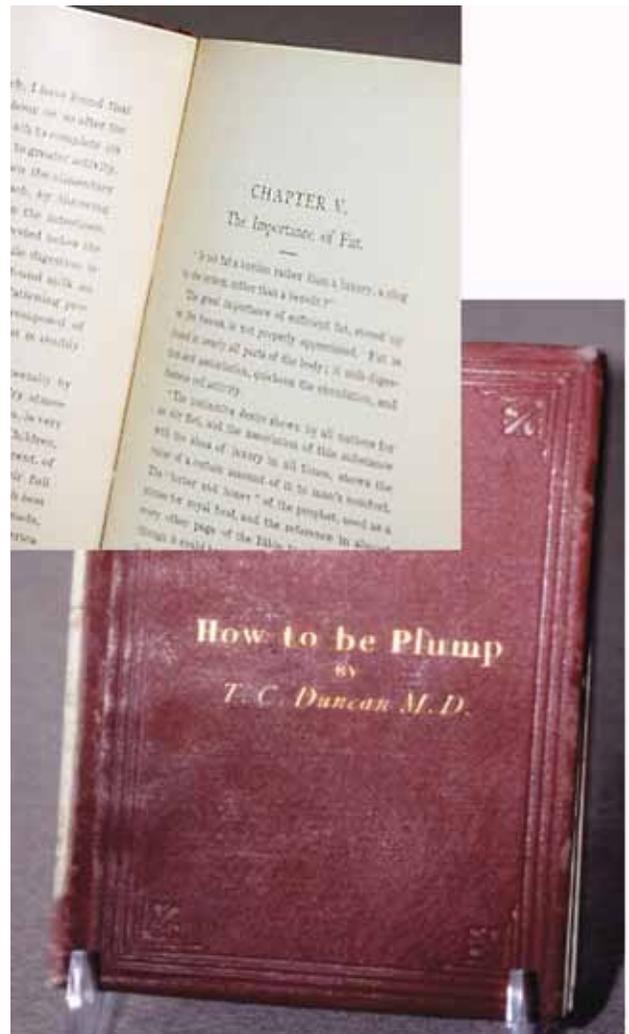
In another study, Chern examined the impact of fat and cholesterol information on the U.S. demand for 10 food items ranging in fat content from low to high, again taking into account relative food prices and household incomes. An

increase in health information led to increased consumption of fresh fruits and vegetables and decreased consumption of meats, eggs, and fats and oils.

### Some Consumers More Responsive to Diet and Health Information

The studies examined above present evidence at the aggregate level that the consumption patterns of many food commodities have been affected by growing information on the link between diet and health. To understand how this effect is generated at the individual consumer level, economists have developed theories of consumer behavior. When tested with person-level data on consumers' health and nutrition knowledge and dietary intake, these theories help us to better understand how health concerns have reshaped consumer food choices.

Consumers seek to maximize satisfaction through consumption of goods and services. While some of these goods and services, such as cars or clothing, are purchased in the marketplace, others, such as a person's health, are "produced" by the consumers themselves using time and other resources. Consumers produce health through a number of activities, including exercise, consumption of medical services, and consumption of healthful foods. Some consumers are more efficient producers of health than other consumers. Efficient consumers produce a given health state using fewer health inputs than less-efficient consumers. Efficiency in producing health varies, depending on a consumer's sociodemographic and biological characteristics. For example, more-educated consumers tend to be more-efficient producers of health because they are more likely to acquire and use health and nutrition information to produce a high-quality diet than less-educated consumers. Other factors, such as age, income, gender, and race, also influence a consumer's propensity to ac-



quire and use health information in dietary decisionmaking.

To investigate the factors associated with differences among consumers in their ability to acquire and use diet and nutrition information, researchers at USDA's Economic Research Service (ERS) analyzed consumer responses from the 1994-1996 Diet and Health Knowledge Survey (DHKS). The DHKS, a followup to USDA's Continuing Survey of Food Intakes by Individuals (CSFII), measures the nutrition knowledge, attitudes, and beliefs about nutrition and healthful eating of a representative sample of U.S. consumers over age 20. Twenty-seven of the survey questions in the DHKS asked about the sources and occurrence of various nutrients in foods ("Which has more saturated fat: butter or margarine?"), the relationship of specific dietary components to specific

The publishing industry has sated the public's appetite for diet-advice books since the 19th century. Early titles, however, celebrated weight gain and "plumpness."

Credit: Ken Hammond, USDA.

diseases (“Have you heard about any health problems caused by eating too much cholesterol?”), and the number of servings of various food groups in a healthful diet (“How many servings would you say a person of your age and sex should eat each day for good health from the vegetable group?”). The number of correct answers to these questions provides a direct measure of a respondent’s diet and nutrition knowledge.

In general, the survey respondents had high diet and nutrition knowledge. Seventy-four percent of the respondents scored 16 or above on the 27-point test (fig. 2). Knowledge varied greatly, however, based on the respondents’ sociodemographic characteristics, such as education and gender (table 1). For example, other sociodemographics being equal, a college-educated female scored 4.7 points higher on the test than a male with less than a high school education.

Studies show that nutrition knowledge differences among consumers translate into measurable differences in food and nutrient intake. University of Nevada economist Steven Yen and colleagues estimated the impact of consumers’ awareness of the health effects of cholesterol on their decision to consume eggs. Taking into account differences among consumers, Yen found that the egg consumption level of consumers who were aware of the health effects of cholesterol was 13 percent lower than the average egg consumption level.

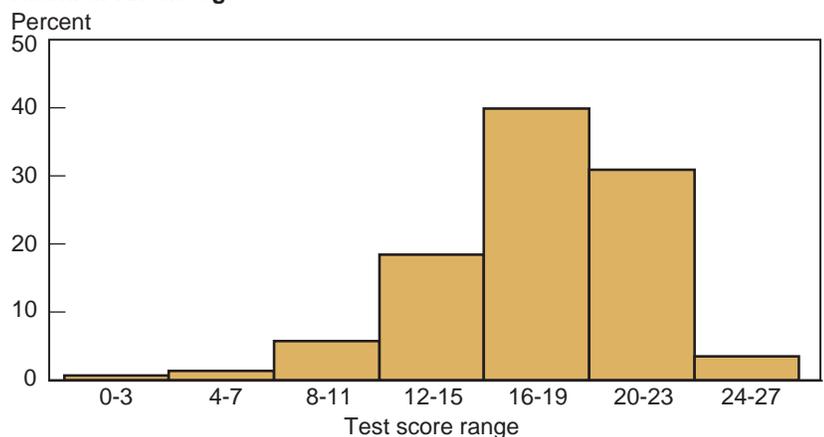
ERS researchers have used CSFII-DHKS data to conduct several studies on the effect of health and nutrition information on the consumption of nutrients and diet quality. These studies provide clear evidence that as an individual’s diet and nutrition knowledge improves, so, too, does his or her nutrient intake and diet quality. In one study, ERS examined the level of diet and nutrition knowledge of main meal planners and preparers in sample households and then measured their actual diet quality. The study assessed diet quality

using USDA’s Healthy Eating Index (HEI), a comprehensive measure of how well a person’s diet conforms to 10 dietary recommendations. The study found that, for two people with similar sociodemographics, the person scoring one point higher on a knowledge scale also scored four to five points higher on the HEI. Based on a mean HEI score of 64.1 on a scale of 0-100, ERS found that a person who acquires the knowledge to answer one more question correctly than a person of similar sociodemographics will improve his or her diet

quality by about 7 percent over the average diet quality.

The diet and nutrition knowledge of the people who plan and prepare the meals in a household influences not only the planner’s food choices but also the diets of other members of their households. Brian Gould and H.C. Lin of the University of Wisconsin examined the impact of meal planners’ diet and health knowledge on the daily fat intake of the planners’ households. The study results showed that, for households similar in other respects, the saturated fat in-

**Figure 2—Many Consumers Score High When Tested on Their Diet and Nutrition Knowledge**



Source: USDA’s Economic Research Service.

**Table 1—Diet and Nutrition Knowledge Increases Steadily With the Level of Education**

Sociodemographic characteristic	Additional diet and nutrition knowledge questions answered correctly
Level of education (compared with those with less than a high school education):	
High school graduate	1.4
Some college	2.4
College graduate or higher	3.1
Age (compared with those age 70 or older):	
20-34	.7
35-54	1.0
55-69	1.3
Male (compared with female)	-1.6
Race: Black (compared with White)	-1.6
Annual per capita income (for an additional \$10,000 above the mean income of \$17,061)	.3

Source: USDA’s Economic Research Service.

take of a household in which the meal planner was aware of the health problems related to saturated fat intake was 19 percent lower than a household in which the meal planner was unaware of such a link. ERS studies show that a mother's knowledge of nutrition and the effects of diet on health affects the nutrient intake and diet quality of her children. ERS research has also established an association between several dimensions of parental nutrition knowledge, such as awareness of the link between diet and health and nutrition facts label use, and the likelihood of the children being overweight.

### Dietary Gaps Remain

Though evidence at both the aggregate and the individual consumer level shows that many consumers react to diet and health information by changing their food-consumption patterns, a large gap remains between the average diets of individuals and a healthful diet as defined by health authorities. USDA's HEI shows that during 1994-96, the latest years for which data are available, 88 percent of individuals had diets classified as "needs improvement" or "poor." Only 12 percent of individuals had diets classified as "good."

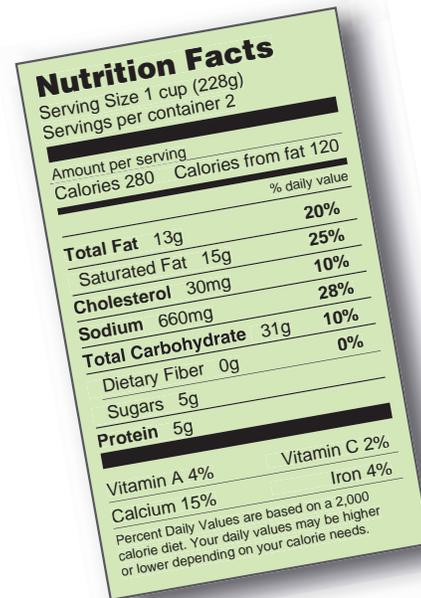
ERS researchers have used aggregate food supply data to determine the daily per capita Food Guide Pyramid servings available in the United States and compare them with Pyramid serving recommendations for the U.S. population. The findings suggest that the American diet is heavily weighted to added fats and sugars and falls short of recommended servings for fruits and dairy products. In 1999, the U.S. food supply provided 1.4 servings per day of fruit, less than half the 3 fruit servings recommended by the Food Guide Pyramid for a 2,200-calorie diet. Although the food supply provided a daily average of four servings of vegetables, which met Pyramid recommendations, actual consumption was tilted to starchy vegetables,

such as potatoes, and fell short on consumption of dark-green leafy vegetables.

The growing girth of the American population is yet another indicator of continuing imbalances in the American diet. From 1966 to 1999, the share of overweight children (ages 6 to 11) in the United States rose from 4 to 13 percent, while the share of overweight or obese adults rose from 47 to 61 percent from 1976 to 1999. Clearly, the changes in food consumption brought about by increases in new health and nutrition information have not been enough to close the gap between healthful diets and average diets.

For some consumers, the gap between optimal and actual diet may be a result of misperceptions about diet quality. Although consumers may be aware of the relationships between diet and disease, many consumers have an erroneous perception of the nutritional adequacy of their own diets. A 1996 survey conducted by New York University and the Center for Science in the Public Interest found that trained dietitians underestimated the calorie content of five restaurant meals by an average of 37 percent and the fat content by 49 percent. The difficulty shown by nutrition experts in assessing the nutrients in their diets magnifies the plight of the general public, especially in light of the growing proportion of food eaten away from home. A recently published ERS study reported that 40 percent of household meal planners/preparers perceived the quality of their diets to be better than the actual quality of their diets.

Another reason for the gap between actual and healthful diet is that some consumers may maximize satisfaction through unhealthy food choices. Given their preferences over a wide variety of food attributes, including taste, convenience, familiarity, and health benefits, some consumers choose to consume unhealthy foods—even when their knowledge of health and nutrition is high. Similarly, de-



Nutrition Facts	
Serving Size 1 cup (228g)	
Servings per container 2	
Amount per serving	
Calories 280	Calories from fat 120
% daily value	
Total Fat 13g	20%
Saturated Fat 15g	25%
Cholesterol 30mg	10%
Sodium 660mg	28%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A 4%	Vitamin C 2%
Calcium 15%	Iron 4%

Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Nutrition facts labels give consumers ready access to health and nutrition-related information about certain products.

spite near universal knowledge about the hazards of smoking, about a quarter of American adults remain smokers.

Nutrition information can benefit consumers even when the information does not have a measurable impact on specific food-consumption choices. Nutrition and health information helps consumers make informed choices about health risks and how to balance such risks. For example, informed consumers may choose to eat an "unhealthful" meal but then increase their daily exercise routine or eat extra-healthy foods for the next couple of meals.

### Optimal Food Choices Depend on Good Information

Information will continue to play an important role in influencing consumer food choices. With the expansion of the Internet and other sources of information, the potential to educate more consumers about the link between diet and health is growing, thereby increasing the potential for substantial reductions in nutrition-related disease. However, along with this potential come problems. The great wealth of information on diet and health may often prove to be overwhelming and counterproductive. Information overload may lead consumers to disregard all information

from all sources. For example, researchers have found that too many product warnings or overly detailed lists of product information on labels may cause many consumers to disregard labels completely. Even if consumers gather information from a number of sources, they may have difficulty ranking the information in order of reliability and importance. As a result, consumers may underreact to important information or overreact to less important information.

Research shows that consumers are often overwhelmed and frustrated by the numerous and diverse messages about diet and health that are issued to the public. A 1996 USDA study found that 40 percent of main meal planners/preparers in households strongly agreed with the statement "There are so many recommendations about healthy ways to eat, it's hard to know what to believe." A 1995 American Dietetic Association survey found that almost 50 percent of respondents thought news reports on nutrition were confusing and 81 percent preferred to hear about new research only after it was accepted by nutritional and health professionals.

The Federal Government has initiated a number of programs to preserve the power of science-based information in helping consumers make optimal food choices. For example, [www.nutrition.gov](http://www.nutrition.gov), a Federal resource established in 2001, provides easy access to all online Federal Government information on nutrition and dietary guidance. The Federal Government also funds programs to examine rival diet and health claims. For example, in February 2000, USDA hosted the Great Nutrition Debate to examine the safety and validity of competing diets, such as the "Atkins' Diet," "Sugar Busters," the "Ornish Diet," and the "Zone Diet." In addition, USDA's Agricultural Research Service conducts original research to identify optimal diet and nutrient intake, determine the

nutritional constituents of foods and diets that sustain and promote health throughout the life cycle, and identify biomarkers of nutritional relevance.

Optimal food choices depend on accurate scientific information. Without accurate information, consumers are unable to allocate food budgets to best match their preferences. As the wealth of information on diet and health grows, the role of the Federal Government in helping consumers sift through competing health claims will also grow. Through its growing network of Web sites and outreach programs, the Federal Government has begun to tackle this important task.

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# Changing Consumer Demands Create Opportunities for U.S. Food System

David E. Davis and Hayden Stewart

In response to shifts in consumer demand, different sectors of the food system are competing to identify and provide more processed and higher value-added products. The foodservice industry has benefited from Americans' desire for convenience. The retail food industry, however, is now responding to the new challenges by offering consumers a variety of processed, ready-to-cook, and ready-to-eat foods.

## Food Marketing Costs Rising Faster Than Farm Value

Consumers' demand for more processed foods is reflected in the growing wedge between annual consumer food expenditures and the value of farm commodities (fig. 1). In 2000, consumer expenditures on domestic food (excluding seafood) consumed at home and away from home totaled \$661 billion. The value farmers contribute

to food expenditures by providing primary agricultural commodities accounted for \$123 billion, or about 19 percent of the total value. The remaining 81 percent reflects the value added as labor, advertising, processing, transportation, packaging, and other marketing costs are incurred transforming farm commodities into food products and meals. In 1970, farm value was 32 percent of consumer food expenditures, while marketing costs were 68 percent.

Researchers with USDA's Economic Research Service predict food expenditures will increase 26 percent over the next 20 years. However, because demand for primary agricultural commodities has been relatively constant, and given the current demand for value-added products, much of this increase will be due to increases in marketing costs.

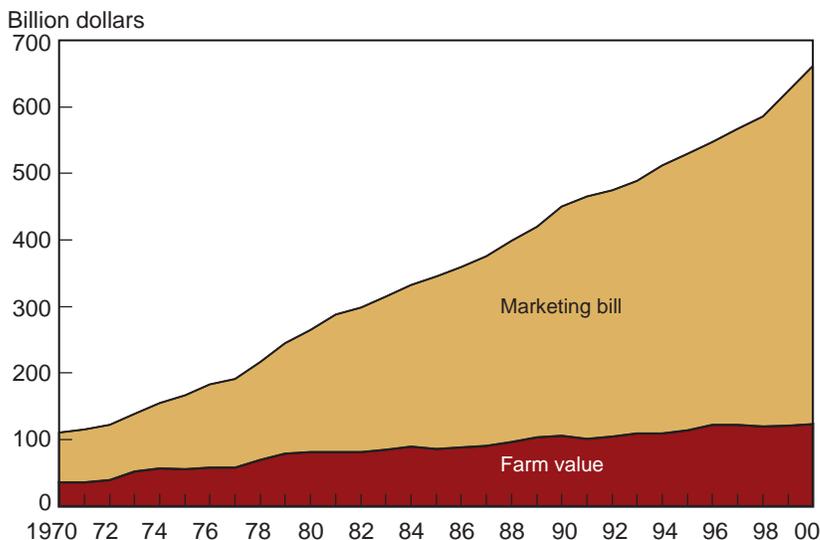
The popularity of dining out is a clear indication of market trends. Snacks and meals prepared by foodservice establishments (away-from-home food) offer consumers a desirable combination of convenience and variety. Expenditures on away-from-home food now account for about 47 percent of total U.S. food expenditures, and the National Restaurant Association projects away-from-home food expenditures will exceed at-home food expenditures by 2010.

Supermarkets and other food retailers are responding to market trends and consumer demand by offering a broader variety of convenient at-home food products. Indeed, retailers are blurring the line between at-home and away-from-home foods by offering products requiring minimal preparation, including ready-to-eat, ready-to-heat, and ready-to-cook products. Again, these products require more processing and labor inputs, causing marketing costs to increase.

## Economic and Demographic Changes Affect Away-From-Home Food Demands

U.S. economic growth has been, and will be, a primary determinant of consumer expenditures on away-from-home foods. Households with higher incomes eat out more frequently and spend more money per dining occasion than households with lower incomes. Studies show a

Figure 1—Marketing Bill Continues to Rise



Source: USDA's Economic Research Service.

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Restaurants are moving to combine the food and atmosphere of full-service restaurants with the speed of limited-service restaurants. This effort has led to a new segment of the market, "fast casual."

Credit: Ken Hammond, USDA.

10-percent increase in income will cause a household's expenditures on away-from-home foods to increase about 4.6 percent, compared with a 1.3-percent increase for expenditures on at-home foods.

Smaller households are also driving America's demand for away-from-home foods. In 1980, the average U.S. household was 2.8 persons per household. By 2020, average U.S. household size is expected to decline to 2.4 persons per household. Studies show that smaller households eat out more often in part because of time and expense economies present in purchasing and preparing meals. The time spent preparing food for each family member tends to decrease as the size of a family increases. For example, it might take 30 minutes to prepare a meal for four and 20 minutes to prepare a meal for one. Furthermore, the per person monetary costs of preparing meals likely decrease as household size increases. Larger households can benefit by purchasing larger package sizes with lower per unit costs. In total, single-person households have the highest per person time and monetary costs for purchasing and preparing meals.

Differences in dining out preferences across generations may also be important determinants of away-from-home food consumption. Past consumption patterns suggest that an individual's away-from-home food expenditures decrease as the individual ages. However, these patterns may not apply to future generations of aging Americans, particularly baby boomers. Baby boomers may continue to prefer dining out, counteracting the traditional age effect that predicts a decline in away-from-home food expenditures. As baby boomers are making up a large and increasing share of the overall population, their future dining habits will have a significant effect on the foodservice industry.

The degree to which America's growing ethnic and racial diversity will affect away-from-home food expenditures is uncertain. Controlling for income effects, studies show that some minority consumers have historically dined out less frequently and spent less when dining out than nonminority households. The plethora of ethnic restaurants today may reflect both increased population diversity and increased demand for ethnic variety driven by better traveled and wealthier U.S. consumers. The baby boomers and younger generations are more traveled than previous generations and seem to value diverse cuisine and dining experiences as attributes of a good meal.

### Limited-Service Restaurants Growing More Slowly? ...

Economic and demographic trends in the United States are not only affecting overall consumer expenditures on away-from-home foods but are also influencing consumer choice in the types of away-from-home facilities to patronize. Limited-service and full-service restaurants are the largest categories of commercial eating-and-drinking places in terms of expenditures (fig. 2). Limited-service restaurants are facilities that do not have waitstaff and require customers to pay for their food at a

counter after their order is taken. These establishments range from the traditional fast food hamburger and fried chicken chains to kebob shops and sandwich shops. High-growth concepts include Subway Restaurants, a chain that sells a variety of submarine sandwiches. Over the past few years, Subway has upgraded its menu by increasing the variety of breads and other ingredients offered. The company has also emphasized the health benefits of its low-fat sandwiches. According to company reports, sales at existing restaurants grew, on average, about 18 percent in 2000. Subway also celebrated the opening of its 15,000th restaurant in April 2001.

Growth is less robust among some traditional limited-service concepts. For example, the largest Burger King franchisee, Ameri-King, reportedly had been opening about 20 new Burger King stores annually and buying 20-40 existing stores each year. About 2 years ago, the company curtailed its growth plans in response to weak sales.

New avenues for growth among traditional fast food outlets, such as Pizza Hut or Taco Bell, include opening new restaurants in retail stores, such as Wal-Mart and Target. Some limited-service chains are also trying to deliver more convenience to consumers by accepting debit and credit cards, forms of payment not traditionally accepted at these restaurants (table 1).

The future for limited-service restaurants is uncertain. Current trends suggest other foodservice sectors will likely grow faster than many limited-service restaurants. However, the industry can be expected to make further adaptations to generate growth. If some limited-service restaurants continue to struggle, more successful firms may leverage their growth by acquiring or merging with less successful firms.

### ...While Full-Service Restaurants Shine?

Varied growth rates across different types of away-from-home

food establishments suggest that consumer demand for convenience is not the only force behind current trends. Some consumers are also looking for dining amenities and diverse menus. The National Restaurant Association forecasts that sales at full-service restaurants will grow faster than at limited-service establishments through 2010. Unlike limited-service facilities, "full-service" dining establishments have waitstaff, may serve alcohol, generally accept credit cards, and may have more formal seating and interior decorations.

Growing full-service enterprises include Applebee's Neighborhood Grill & Bar and T.G.I. Friday's. Consumer demand for convenience as well as demand for more dining amenities and diversity can explain the success of these establishments. These amenities include the services associated with full-service restaurants, such as waitstaff, alcohol service, and, possibly, restaurant decor. Diversity may include a wider range of menu offerings and meals tailored to groups with health or environmental concerns. For example, T.G.I. Friday's features Meyer Natural Angus beef burgers. According to company literature: "These new 100 percent natural Angus beef burgers are made from Meyer Natural Angus cattle, raised on a strict diet of wholesome forages and grains. The cattle are never administered hormones, antibiotics or animal by-products. In addition, a single source of origin helps ensure the quality of the hamburger from supplier to restaurant locations."

Other new dining-out concepts are emerging to satisfy a variety of consumer demands. "Fast-casual" restaurants, such as Boston Market, Chili's Express, and Schlotzsky's Deli, are combining the food and atmosphere of full-service restaurants with the speed of fast food restaurants. Similarly, takeout dining is increasingly popular at limited-service, fast food type restaurants. The National Restaurant Association reports the share of customers at limited-service

restaurants ordering food for on-premises dining fell from 36.6 percent of customers in 1993 to 34.3 percent in 2000.

### Food Retailers Responding to Consumers' Demand for Variety....

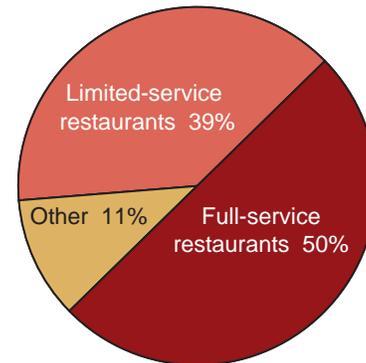
Food retailers are responding to consumers' demand for convenience and healthful foods by providing a greater variety of food products in a wider variety of formats. The median number of items carried by U.S. supermarkets was about 40,000 in 1999, far greater than the 14,000 items offered in 1980. Today's supermarkets strive to satisfy consumer preferences for one-stop shopping by offering many nonfood items and a variety of other services, such as floral items and banking services.

Changes in supermarket produce departments exemplify changes taking place in other food departments in U.S. supermarkets. Cornell University tracks produce Stock Keeping Units (SKU) in large (greater than \$1.5 billion in sales) and small (less than \$300 million in sales) supermarkets. In 1994, both size stores offered fewer than 350 produce items. By 1999, large firms offered about 480 produce items and small firms offered about 400 items. Furthermore, Cornell forecasts large firms will offer 558 produce items by 2004 and small firms will offer 541 items. While supermarket produce departments are changing and are offering more nonfresh food items, such as floral items, the large increase in items offered is more like-

ly a result of the industry's response to consumer demand for more fresh produce. The growth of bagged salads and other packaged fresh-cut products offers further evidence of the industry's response to consumer demand for convenient, healthful foods. As the U.S. population ages and per capita incomes increase, these trends will continue.

Retailers are also responding to consumer demand for the ultimate convenience food, the restaurant meal, by offering ready-to-eat entrees and side dishes. According to a Food Marketing Institute survey conducted in 2000, 83 percent of consumers said their supermarkets offered ready-to-eat or takeout food. As incomes increase and consumers demand more prepared foods, these retail food trends

**Figure 2—Full-Service Restaurants Accounted for 50 Percent of All Sales at Commercial Eating-and-Drinking Places in 2000**



Note: The category "other" includes commercial cafeterias, social caterers, snack and nonalcoholic-beverage bars, bars, and taverns.

Source: *Restaurant Industry Forecast 2001*, National Restaurant Association.

**Table 1—Limited-Service Restaurants Now Offer More Convenience-Oriented Services**

Service offered	Average check size	
	Under \$5	\$5 or More
	<i>Percent of operators</i>	
Drive-thru window	79	54
Self-service beverage kiosk	57	53
Option to pay by credit card	36	54
Self-serve customer-activated ordering terminals	7	2

Source: *Quickservice Trends*, National Restaurant Association.

## The Meat Industry Responds With New Products and Business Arrangements

The meat industry provides an example of how changing consumer demands require the participants in the food system—farmers, processors, retailers, and foodservice operators—to adapt. Since 1970, U.S. per capita consumption of chicken has increased from 40 pounds per year to over 80 pounds per year, while per capita beef consumption decreased from 84 pounds per year to 62.5 pounds per year. Per capita pork consumption has remained relatively flat at about 50 pounds per year.

This contrast in consumption of beef and chicken can be explained by several factors, including health concerns associated with the fat content of beef and changes in relative prices. However, a large part of the increase in poultry consumption may be due to the industry's emphasis on producing value-added, convenient products. The National Chicken Council reports that only 34.7 percent of total processed broilers in 1974 were sold as cut-up pieces, a value-added, more convenient product as opposed to whole roasters. By 1989, the share of cut-up chicken grew to over 60 percent and increased to 65.4 percent in 1999. Further processed products (patties, fillets, and nuggets) represented 2.9 percent of processed broilers in 1981 but increased to 10.2 percent in 1999. An integrated production process and changes in technology have enabled the industry to provide a consistently high-quality poultry product for consumers.

Members of the beef and pork industries are attempting to make their products more convenient for consumers. The National Cattlemen's Beef Association and the National Pork Producers Council have encouraged and supported development of convenient red meat products. All major red meat processors now offer a variety of convenient, fully cooked, or microwave-ready products. Moving away from selling meat as an unbranded commodity, and again emulating poultry processors, beef and pork processors now are differentiating themselves from their competitors by branding their products. These branded products are frequently prepackaged and sold to retailers as "case-ready."

Meat processors are also strategically realigning to build on their core businesses and expand further into more processed, higher profit margin food products. In 2000, IBP, one of the Nation's largest processors of fresh beef and pork products, realigned itself to better capture the value-added markets for red meats. After acquiring Corporate Brand Foods America and other companies specializing in further processing, IBP restructured and expanded its value-added business operations. In late 2000, the company became the subject of takeover attempts by Tyson Foods and Smithfield Foods. These companies' interest in IBP stemmed, in part, from a desire to apply value-added successes in chicken (Tyson) and pork (Smithfield) to beef, IBP's strongest red meat product. The matter was resolved in summer 2001 when Tyson Foods acquired IBP.

should continue, representing more competition for limited-service restaurants.

U.S. food retailers are also offering a variety of new food products. *The New Product News* reports that new food product introductions averaged approximately 12,624 items annually between 1990 and 1999. New food product introductions peaked in 1995 at 16,863 items and decreased in each successive year. However, the 9,145 new products introduced in 2000 are still far more than the 2,689 new products introduced in 1980 (see "Food Product Introductions Continue to Decline in 2000" elsewhere in this issue).

Research suggests that income growth and changes in demographics affect the number of food items demanded by consumers. For example, a Texas A&M and Cornell University study estimates that a 10-percent increase in income is associated with a 0.7-percent increase in demand for ready-to-eat meals. Consumer time constraints also likely affect the number of food items demanded. Researchers have found that areas with high rates of women in the workforce are associated with a less diverse basket of goods purchased. Households in these areas purchase fewer traditional goods for at-home meal preparation but purchase more prepared products.

Studies also indicate that ethnicity affects consumer demand for food products. A study in *Agribusiness* shows that areas with a more diverse population are associated with a more diverse basket of goods purchased. Retailers are responding to increasing ethnic diversity among consumers in a number of ways. For example, Nash-Finch Company, a Fortune 500 food retailer and distributor, is developing a new Hispanic-oriented supermarket concept for four pilot stores in the upper Midwest. Wholesalers that can supply retailers with food items demanded by their ethnically diverse customers are also benefiting from the Nation's changing demographics. For

example, Samra Produce, a Los Angeles-based food wholesaler, provides okra and other specialty vegetables to smaller supermarkets serving diverse communities. Supermarkets with ethnically diverse customers will likely increase their offerings of meat products and fruits and vegetables, tailoring new selections to the preferences of their customers.

## .... And Low Prices and Convenience

Some consumers are making more of their food purchases from less traditional outlets. From 1990 to 2000, nontraditional retailers increased their share of at-home food expenditures from 13.4 to 24.5 percent. Nontraditional retailers include warehouse club stores, supercenters, mass merchandisers, drug stores, and mail order outlets. Supercenters, such as Wal-Mart stores with a full-line grocery area to rival supermarkets, and warehouse club stores, such as Costco and Sam's Club, are the fastest growing segment of nontraditional food retailers. Warehouse club stores and supercenters accounted for less than 2 percent of at-home food expenditures annually until the early 1990s but increased their share from 1.5 percent in 1990 to 6.3 percent in 2000.

The success of nontraditional retailers likely results from consumers' desire for economy and convenience. Warehouse club stores offer large package sizes with lower per unit prices, and like discount stores, a variety of nonfood items, further reinforcing the trend toward one-stop shopping observed in traditional supermarkets. As consumers continue to demand convenience, nontraditional retailers will likely continue to capture significant food sales.

## Consumers Also Looking for Natural Products and More Convenient Packaging

Health-conscious consumers are driving increases in sales of organic and natural food products. The Natural Marketing Institute re-

ports sales of organic foods reached \$7.8 billion in 2000, a 20-percent increase over sales of \$6.5 billion in 1999. Specialized retailers, such as natural foods supermarkets, are benefiting from this trend. Natural foods supermarkets offer less processed foods and more foods that are frequently free of preservatives, hormones, and artificial ingredients. These stores are larger than traditional health food stores and offer a broader number of departments, similar to traditional supermarkets. Successful natural foods supermarkets include Whole Foods Market and Wild Oats Markets. These chains grew rapidly throughout the 1990s, following aggressive growth strategies through mergers and acquisitions.

Reflecting the industry trend toward more processed products, retailers are offering many food products in a variety of sizes and convenient packages. This trend seems driven by at least two factors: decreasing average household sizes and an aging population are requiring smaller and resealable packaging; and, technology innovations, driven by consumer demand for convenience and quality, are leading to new package designs. For example, bagged salads represent a significant packaging innovation in the produce aisle. Similarly, consumers are finding more branded, pre-cut, and individually wrapped (known as case-ready) cuts of meat in the meat case (see box). Other new packaging concepts include yogurt in a tube and fruit juice boxes and pouches that make products more portable and convenient.

Consumers will dictate the future course of the food system. Different sectors of the system are competing for consumer food dollars by providing value-added meals and food products now in high demand. Foodservice operators are likely to continue supplying many of these goods. Retailers are also responding to the current challenge. Manufacturers appear



ready to take advantage of every marketing opportunity by changing packaging, offering new and innovative products, and serving a culturally diverse customer base. In the years ahead, successful firms in the food system will adapt to the changing tastes of consumers and capitalize on changes in their demographic makeup.

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**Nontraditional retailers, including warehouse club stores that entice customers with large package sizes and lower per unit prices, have increased their share of at-home food expenditures to 25 percent.**

**Credit: Ken Hammond, USDA.**

# Food Product Introductions Continue To Decline in 2000

J. Michael Harris

New food product introductions in the United States declined for the fifth consecutive year in 2000. The decline marks a significant reversal of increasing numbers of new products introduced during the first half of the 1990s. New product introductions rose dramatically from over 10,000 in 1990 to a peak of nearly 17,000 in 1995; however, that number fell to slightly more than 9,000 in 2000. The decline represents a 46-percent decrease between 1995 and 2000.

New food product introductions in 2000 were down in all food categories, compared with product introductions in 1995 (table 1). The top five categories (in terms of number of new products) in 2000 declined significantly over the 1995-2000 period: candy, gum, and snacks (down 22 percent); condiments (down 51 percent); beverages (down 55 percent); bakery products (down 55 percent); and dairy (down 47 percent).

Introductions of new nonfood products, however, were up in 2000. Growing numbers of new health and beauty aids, pet foods, and tobacco products offset a decline in household supplies and paper products.

New food product introductions include new national and regional brands, seasonal products, and private label products. According to A.C. Nielsen, a market research company, 77 percent of new products are “me-too” products—differ-

ent versions of the same product offered by different manufacturers. Only about 1.5 percent of new products are “classically innovative” products, and 6 percent are line extensions, such as different sizes of the same brand. Seasonal products make up 13 percent of new products introduced each year.

Many new products have a short lifespan. Only between one-fifth to one-third of all new products are successful. Most new products reach distribution in 75 percent of sales outlets within the first 9 months of year one in the product’s life. Sales of successful products continue to grow in years two and three; sales of failed products decline in years two and three. The success of a new product may spell the failure of an existing product, however, as new products succeed

mainly by capturing sales from other products.

Although new product introductions have declined, the variety of products in U.S. grocery stores has grown considerably as manufacturers continue to introduce successful new products. These successful products address continually changing consumer demands for food products providing more convenience, ethnic variety, and diet and health benefits. The total number of food products available in today’s marketplace now exceeds 300,000 (although not all at once and not in every store), and the median number of items carried by supermarkets is about 40,000, compared with about 26,000 10 years ago.

Small- and medium-sized food manufacturers introduced 86 per-



Rising ethnic diversity in the United States, especially the growing Hispanic population, increasingly influences food product developers.

Credit: Ken Hammond, USDA.

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cent of new products in 2000 (fig. 1). This share represents not only smaller national manufacturers with national brands but also regional manufacturers with regional brands. The 20 largest U.S. food companies introduced only 14 percent of new products in 2000.

New product introductions are critical to both manufacturers and retailers. By meeting constantly changing consumer demands for new food products, manufacturers and retailers attract new customers and increase sales, profits, and market share. Manufacturers that have a record of introducing successful new products are likely to have success negotiating with retailers for additional shelf space for their products.

### Reasons for Declines

Any of several factors may have led to the decline in new food product introductions. First, consolidation in food manufacturing has reduced the number of companies offering new products. Firms in-

involved in new acquisitions or consolidations may be more concerned with reorganizing profitably than with developing new products. Consolidation also may reduce the number of product lines when newly formed firms eliminate redundant lines.

Second, efficient consumer response (ECR) technology has enabled manufacturers to more effectively conduct market research prior to and after new product introduction. Computer-aided analyses of checkout scanner data and focus groups help product developers better determine what types of products consumers are purchasing and enable manufacturers to closely monitor the sales rates of new products (see "Innovation by Food Companies Key to Growth and Profitability" elsewhere in this issue). Thus, manufacturers can use ECR as a market research tool to identify growth areas and to weed out product failures quicker, putting downward pressure on the number of products introduced.

Third, new branded products face more competition from private label products for grocery store shelf space. As retailers devote more shelf space to their own private label products, the amount of available space for new products decreases. Increased competition



In the competition for grocery store shelf space, new branded products must continually go up against retailers' private label products.

Credit: Ken Hammond, USDA.



**Table 1—New Product Introductions of Beverages and Bakery Products Dropped by More Than Half, 1995-2000**

Category	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
<i>Number of new products</i>											
Food categories:											
Baby food	31	95	53	7	45	61	25	53	35	21	16
Bakery products	1,546	1,966	1,854	1,803	2,180	2,432	1,759	1,622	1,471	1,126	1,087
Beverages	1,143	1,367	1,538	1,845	2,250	2,854	2,003	1,606	1,547	1,576	1,271
Breakfast cereals	123	104	122	99	110	128	121	83	84	114	88
Condiments	2,028	2,787	2,555	3,147	3,271	3,698	2,815	2,631	1,994	1,676	1,808
Candy, gum, and snacks	1,486	1,885	2,068	2,043	2,450	2,462	2,310	2,505	2,065	1,983	1,924
Dairy	1,327	1,111	1,320	1,099	1,323	1,614	1,345	862	940	921	858
Desserts	49	124	93	158	215	125	100	109	117	73	78
Entrees	753	808	698	631	694	748	597	629	678	543	550
Fruit and vegetables	325	356	276	407	487	545	552	405	375	254	192
Pet food	130	202	179	276	161	174	121	251	105	158	157
Processed meat	663	798	785	454	565	790	637	672	728	646	583
Side dishes	538	530	560	680	980	940	611	678	597	421	317
Soups	159	265	211	248	264	292	270	292	299	254	216
Total, food	10,301	12,398	12,312	12,893	15,006	16,863	13,266	12,398	11,035	9,766	9,145
Nonfood categories:											
Health and beauty aids	2,379	3,064	3,690	3,864	4,368	4,897	5,702	6,226	6,467	6,257	6,573
Household supplies and paper products	491	588	627	612	609	571	381	371	265	453	384
Tobacco products	31	19	45	38	38	102	54	127	51	32	42
Pet products	42	74	116	160	55	139	169	202	120	138	143
Total, nonfood	2,943	3,745	4,478	4,674	5,070	5,709	6,306	6,926	6,903	6,880	7,142
Total, food and nonfood	13,244	16,143	16,790	17,571	20,076	22,572	19,572	19,324	17,938	16,646	16,390

Source: *New Product News*, selected issues.

**Table 2—All-Natural Products Introduced to Marketplace Nearly Tripled, 1995-2000**

Category <sup>1</sup>	1995	1996	1997	1998	1999	2000
	<i>Number of new products</i>					
Added/high calcium	21	35	28	45	119	158
No additives/preservatives	167	143	142	149	346	269
Low/no cholesterol	163	223	106	124	244	189
Added/high fiber	40	12	33	43	67	81
Reduced/low salt	205	171	87	80	97	131
Organic	538	645	505	842	783	844
All natural	407	645	587	743	522	1,130
Reduced/low calorie	1,161	776	742	456	302	261
Reduced/low sugar	422	373	78	164	74	61
Reduced/low fat	1,914	2,076	1,405	1,180	481	1,057

<sup>1</sup>Nutritional claims categories are not additive since new products may carry more than one claim.  
Source: *New Product News*.

for shelf space, plus slotting fees and promotion allowances, may combine to put downward pressure on the number of new branded products. Slotting fees are monies paid to retailers by manufacturers to secure shelf space. Promotion allowances are concessions offered by manufacturers to entice retailers to stock specific branded products.

Lastly, some food categories may be nearing product saturation. Too many products, especially line extensions, can confuse consumers. Instead of providing shoppers with more variety, larger and larger numbers of products may result in a confusing proliferation of essentially identical products.

### Natural and Organic Increase; Reduced-Fat and Low-Fat Rebound

New “all-natural” food products increased 178 percent from 1995 to 2000, while new organic products increased 57 percent (table 2). In 2000, 1,130 all-natural food products were introduced to the marketplace, compared with 1,057 reduced- or low-fat new products. New organic food products totaled 844 in 2000. The growing number of natural or organic products reflects the desire of consumers to eat more “naturally.” The adoption of new USDA organic standards by the food industry also increased consumer confidence in organic

claims and consumer demand for these products as well.

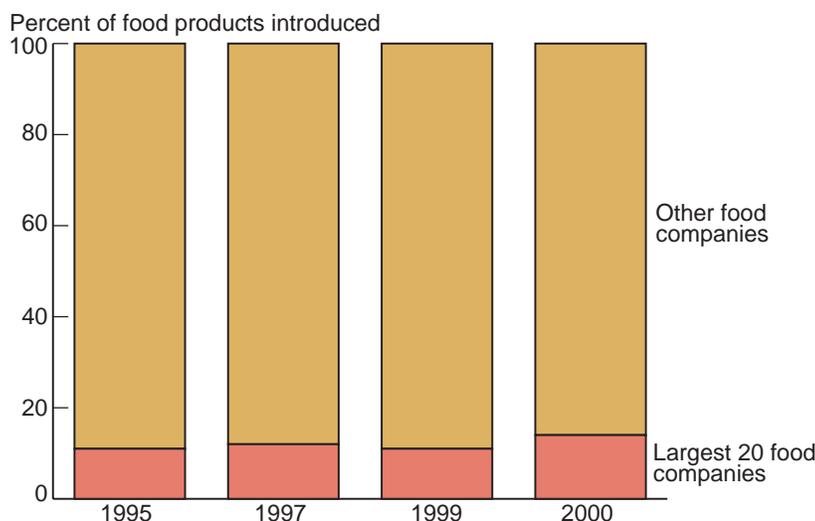
The number of new food products labeled “reduced-fat” and “low-fat” in 2000 was 49 percent lower than in 1996. However, despite dropping 59 percent from 1998 to 1999, the number of these new products more than doubled between 1999 and 2000. The increase in reduced- and low-fat product introductions may reflect the food industry’s use of fat replacement ingredients that consumers find more acceptable.

Developers of new products have not overlooked the area of new “functional foods.” These products are enriched with calcium and other nutrients specifically targeted toward health-conscious consumers. Calcium-fortified and soy products are new functional foods that are popular with consumers. In 2000, food manufacturers introduced 158 new food products with added calcium or claiming to be high in calcium. Consumers are also demanding more foods enriched with vitamin A, vitamin C, and fiber.

### New Convenience Products Growing

New convenience foods continue to contribute significantly to the number of new product introductions, particularly handheld or prepackaged entrees and other products that offer convenience and require little preparation. New

**Figure 1—Largest 20 Food Companies Accounted for 14 Percent of New Product Introductions in 2000**



Source: *New Product News*.

**Table 3—Sauces and Seasonings Weigh Heavy in Number of New Convenience Foods in 1999**

Category	Number of products introduced
Sauces	610
Pizza and entrees	432
Soups	254
Seasonings	238
Pasta	231
Vegetables	158
Meal kits	76
Other side dishes	71
Potato products	60
Rice	59
Prepared meals	35
Total	2,224

Source: *New Product News*/Global New Product Database and *Prepared Foods*.

products that require some amount of preparation by the consumer, such as meal kits or packaged sauces, are also important new convenience products. New convenience foods reflect the response of manufacturers and retailers to the loss of sales due to the rising popularity of dining out.

According to *Prepared Foods*, a food trade publication, the number of new convenience meals and meal components remained strong in 1999 (table 3). The top new product introductions in this category were sauces (610), pizzas and entrees (432), soups (254), seasonings (238), pasta (231), and vegetables (158). Quick, convenient sauces and seasonings enable consumers to add increasingly popular ethnic flavorings to their foods. Heat-and-serve entrees and meal kits provide further convenient alternatives. Salad kits containing new ingredients, such as sliced carrots and snow peas, were also introduced.

According to the Institute of Food Technologists, convenience, freshness, and sophistication are the principal trends in consumer food demand shaping the look of new food products. The primary form of at-home convenience foods are new products that require little preparation, save time, and come prepackaged for cooking. Another popular type of convenience food is “home-spun” meals, which include

prepackaged ingredients, require little knowledge of food preparation, and require little after-meal cleanup.

Consumers are also demanding super-savory and sophisticated new foods—especially foods with an ethnic flair. Food product developers are increasingly influenced by the rising diversity in the United States, especially the growing Hispanic population.

Consumers also favor new foods that are “clean, pure, natural, and safe.” These foods primarily include foods labeled as “natural,”

“containing no preservatives or additives,” or “organic.” Food manufacturers are expected to continue responding to consumer demands by developing and introducing more natural foods and functional foods that may promote better health.

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Despite decreasing for 5 consecutive years, successful product introductions have enabled U.S. grocery stores to meet consumer demand for product variety. In the last 10 years, the median number of items carried by supermarkets grew from 26,000 to 40,000.

Credit: Ken Hammond, USDA.



# Innovation by Food Companies Key to Growth and Profitability

Hayden Stewart and Steve Martinez

Consumers today are demanding an increasingly wide variety of foods, retail formats, and restaurant concepts. Food manufacturers, distributors, retailers, and foodservice operators face additional demands as they strive to profitably supply the large variety of goods and services on time and in the correct quantity.

The task facing the food industry is neither easy nor cost-free. Some food firms are responding to the challenge by making innovative operational changes, reshaping how they work together with other members of the food supply chain and how they organize themselves as individual companies. Most notably, many food retailers are working more closely with distributors and manufacturers to best serve the consumer. Also, many individual firms at each stage of the supply chain are adjusting the size and scope of their operations.

## Collaboration and Information Technology Satisfy Retail Demand

Wal-Mart was among the first firms to realize that traditional methods of doing business are not always suited for today's marketplace. Formed as a single-store operation in 1962, the firm grew rapidly based on the principles of its founder, Sam Walton. These principles placed value in linking across

the supply chain and using information technology to respond more promptly to the marketplace (see box on Wal-Mart). In the 1990s, Wal-Mart became the Nation's largest retailer and was also applying its knowledge of retail distribution to the food industry. In 2001, Wal-Mart became the Nation's number one food retailer, ahead of traditional food retailers like Kroger and Safeway.

In 1992, grocery retailers and industry trade associations responded to Wal-Mart's success by launching Efficient Consumer Response (ECR). The goals of this initiative include improving operational efficiency to better serve consumers and holding down costs on the supply chain. Early stages of ECR focused on industry-wide activities and studies. Today, individual companies have internal programs to implement techniques derived from the ECR initiative along with their suppliers and their buyers.

One objective of ECR is to effectively manage the mix of products on retail store shelves to increase sales and product turnover. Consumer demand for variety may require a typical supermarket to stock several dozen products in some food categories, such as cereals and salad dressings. Within each category, each product is not a different type of food; rather, each product represents a different combination of product characteristics, such as flavor, type of packaging, package size, and brand. The goal of retailers is to choose the right number and mix of products for each store. However, because a supermarket might carry 40,000 indi-

vidual products, store managers may not manage all categories and products optimally. Stocking too many products could impede stock turnover and increase spoilage. Stocking too few products or the wrong products could prevent consumers from finding their desired goods.

Some retailers are managing product assortment through a procedure known as category management, which involves cooperative efforts between retailers and suppliers. Food store suppliers, such as Procter & Gamble, act as "category captains" by making product-related recommendations, in some cases suggesting retail prices and allocation of shelf space.

A second objective of ECR involves replenishing store shelves when products have been sold. Time-pressed consumers may become frustrated if they cannot find the goods they want when shopping. As such, out-of-stocks are major concerns for retailers. Out-of-stocks are also common. For example, a 1998 study by the National Pork Producers Council found that retailers averaged 29 percent out-of-stocks for pork during peak shopping hours. Reducing out-of-stocks may require retailers to inform suppliers as soon as goods leave a store. In turn, suppliers can then use this information to help manage retailers' inventories. Some retailers use scanners to relay information to suppliers when goods are sold at a retail checkout counter. This instant messaging system enables suppliers to more promptly replenish goods. According to viaLink, the provider of a scanner-based inventory replen-

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ishment system, participants in a recent pilot project increased their sales to retailers 3 to 4 percent on average and reported error-free invoicing and payments.

A third objective of ECR is to reduce inefficiencies associated with transactions between supply chain partners. For example, when food manufacturers have excess inventories, they commonly discount overstocked products. These “sales” may help manufacturers move excess inventories but can also increase distributor costs for managing larger and fluctuating inventories. In turn, these costs may be passed to consumers and further increase price volatility. Such inefficient trade promotions can also fill store shelves with slow-moving, less-desirable goods. For example, a manufacturer of a seasonal product might overestimate demand. The company is then left with excess inventories after the demand for its product has peaked. Using price discounts to encourage retailers to carry out-of-season products could force these retailers to sacrifice shelf space for goods that can otherwise command top dollar.

ECR techniques could minimize the frequency of problems leading to inefficient trade promotions. If food supply chain partners work together to forecast consumer demand, agree upon retail prices, manage product assortment, and replenish inventories, consumer demand will be more predictable for all members of the supply chain. As a result, consumer prices may be kept lower, plant scheduling can be optimized, and inventory fluctuations can be reduced to the level associated with just-in-time inventory replenishment.

A fourth objective of ECR is to increase the success rate of new products. Manufacturers introduce thousands of new food products each year; however, only a limited number of new products are successful (see “Food Product Introductions Continue to Decline in 2000” elsewhere in this issue). Frequent new product failures are expensive to manufacturers and

probably inflate consumer prices. With a focus on meeting consumer demand, co-development and testing of products by all members of the supply chain should improve the success rate of new products.

### Foodservice Customers Also Better Served

In 1996, the foodservice industry launched its own initiative, the Efficient Foodservice Response (EFR). Like ECR, EFR relies heavily on information technology, but EFR is more narrowly focused on removing fundamental supply chain inefficiencies.

The most widely publicized EFR objective is promoting the use of standard product identification codes, especially in the form of bar codes—a practice common in food retailing. According to the International Foodservice Distributors Association, many manufacturers, distributors, and foodservice operators use their own internal numbering schemes for identifying products. Other members of the supply chain then have to translate these numbering schemes when placing an order. This process is an inefficient use of resources and is prone to record-keeping errors.

By contrast, bar coding provides a common set of product identification codes, facilitates traceback related to food safety, and reduces errors in a number of activities, such as ordering, shipping, and inventory management. Only 1 of every 3 million scanned entries results in an error, compared with 1 of every

300 manually keyed entries. Errors in supply chain activities can raise consumer prices and cause supply disruptions that inconvenience both producers and consumers. Tyson Foods, the largest chicken producer in the United States, bar codes nearly 100 percent of its 4,000 products to ensure error-free tracking of products from the production line to cold storage to the retailer.

Longrun plans for EFR include the adoption of many ECR-like techniques. At this time, the industry is moving to implement an electronic marketplace to enable more advanced supply chain initiatives, such as efficient inventory replenishment. Currently, companies are proposing platforms for this marketplace. For example, in July 2000, industry leaders, including McDonald’s, Sysco, Cargill, and Tyson Foods, launched eFS Network. The goal of eFS Network is to create an Internet-based, industrywide marketplace for foodservice companies. Importantly, eFS Network will facilitate both public transactions and confidential transactions between companies and their supply chain partners.

EFR may appear to be focused on cost-reduction, but the initiative’s true objective is growth, a point industry insiders feel is overlooked. “EFR’s ‘removing inefficiencies’ sounds too much like ‘downsizing,’” said a foodservice industry supplier. “If EFR can help lower costs, and thereby allow lower menu prices, its biggest benefit will



Consumer demand for variety may require a typical supermarket to stock several dozen products in some food categories, such as salad dressings.

Credit: Ken Hammond, USDA.



Some retailers use checkout scanners equipped with instant messaging systems that automatically inform suppliers about changes in retail stocks.

Credit: Ken Hammond, USDA.

be drawing cost-conscious consumers into restaurants for three or four more meals a week. This could add considerably to everyone's gross sales."

### Retailers Merge To Serve

In addition to spurring ECR and EFR, trends in consumer demand are also driving structural change across a number of food markets, such as food retailing. Structural change is measured as changes in the size and number of all firms in an industry, as well as in the market share of the largest firms. For example, to better serve customers and increase profits, a company might explore growth through mergers and acquisitions. The specific organizational changes being made vary by market, by the position of the firm on the supply chain, and even by factors specific to each firm.

In the food retailing sector, many firms are becoming larger in both the size and scope of their operations. Retailers must build physically larger supermarkets to supply more goods and services for today's convenience-minded consumers, but they face challenges in doing so. Most supermarkets today supply increasing amounts of value-added foods, prepared foods, and services, such as foodservice counters with hot or heat-and-serve items. Offering these new goods and services in one place is convenient for consumers and might therefore increase retail sales in an industry with otherwise slow growth. However, these larger stores also have high costs for overhead and labor. To successfully

compete with discount retailers, such as Wal-Mart and Costco, food retailers may require organizational adjustments to both provide customers desirable products and hold down the average cost of handling products.

Many grocery retailers have explored mergers and acquisitions as a possible solution to current challenges. Operating more stores might enable retailers to hold down the average cost of handling products. Chain stores with large total sales volumes are more likely to successfully negotiate prices and enter into long-term agreements with suppliers, such as contracts to procure products to resell as proprietary, store-branded goods. Large chains may also be able to achieve lower unit costs, or economies of scale. Large capital investments are required to implement cost-saving techniques. These investments can include company-wide satellite systems, Internet communications, and other technologically advanced equipment. Chains can spread the costs of these investments over more products and more stores, reducing the average cost of the investment per store and per product.

Mergers and acquisitions in the retail grocery industry have resulted in larger chain stores that command a greater share of total industry sales. The nationwide market share of the four largest grocery chains reached 27.4 percent in 2000, compared with 17.0 percent in 1987. Grocery retailing remains relatively less consolidated on the national level than many other sectors of the economy. The situation is less clear in some regional and local markets. A study by USDA's Economic Research Service (ERS) found that the market share of the four largest food retailers in the Nation's 100 largest cities averaged 68.6 percent in 1992 and 72.3 percent in 1998.

### Some Distributors Also Consolidating

Trends in consumer demand are also changing the role of food

distributors in today's marketplace. Distributors have traditionally purchased goods from manufacturers, stocked these goods, and resold and shipped the goods to retailers. However, distributors are now being asked to supply additional services, stock a wider variety of goods, and deliver these goods to a wider variety of retailers and restaurants.

In the foodservice industry, the role of a distributor has depended on the relationship between the restaurant and the food processor, as well as on the type of product being traded. For example, broadline distributors are the most comprehensive type of distributor and tend to serve single-unit restaurants and some small chains. A broadline distributor purchases a variety of food products from numerous processors, stocks the goods in a warehouse, and delivers the ordered products to the restaurants. Other types of distributors have more restricted operations. Specialty distributors handle only a narrow range of products, such as meats or produce. Systems distributors serve mostly chain restaurants that centralize purchasing.

The increasing diversity of restaurant types and menus demanded by today's consumers creates challenges for distributors, especially broadline distributors. These distributors serve a range of restaurant concepts with a nearly complete array of products for each restaurant client. Moreover, these clients tend to offer a wider variety of menu selections and change menu items frequently. Working with restaurant operators to grow their businesses and procure the desired goods on time, in the right quantities, and at profitable prices is an increasingly hands-on, high-tech job for distributors. The largest broadline distributor, Sysco, operates nationwide and maintains several proprietary product lines, such as Buckhead Beef and Newport Pride (beef products) and Sysco Natural and FreshPoint (produce). Notably, FreshPoint operations include facilities to ripen sea-

sonal fruits and tomatoes so that Sysco can offer these items to its clients on a year-round basis. Sysco also invests in information technology and other equipment to keep down costs, as well as expand the range of services offered. Clients can order products from Sysco over the Internet (about \$1.5 billion in annual sales). Sysco also provides a service that helps restaurant operators offer customers such amenities as electronic gift certificates and customized birthday cards.

As with grocery retailers, distributors of all sizes may not be equally suited to the challenge of better serving their customers and remaining profitable. Large distributors tend to be more successful at negotiating with suppliers, and economies of scale may exist in offering the wide range of goods and services now demanded by clients. Consequently, some firms are becoming larger in both size and scope. Most notably, major broadline distributors are expanding the size of their broadline operations as well as adding specialty and systems operations. For example, Sysco is expanding its systems operation, SYGMA Network. The company secured an agreement to serve 264 Applebee's restaurants in 2000. Also, in 2000, Sysco purchased custom-cutting meat companies and a supplier to the hospitality and lodging industry.

Like consolidation in grocery retailing, overall consolidation in foodservice distribution remains uneven. McKinsey & Company, a private consulting firm, estimates that the market share of the 10 largest foodservice distributors increased from 17 percent in 1990 to 28 percent in 2000. However, this figure understates the extent of consolidation among broadline distributors. Broadline distributors accounted for almost 50 percent of all foodservice distributor sales in 2000, and the top four firms—Sysco, U.S. Foodservice, Alliant, and Performance Food Group—accounted for almost 50 percent of these sales. Moreover, trends toward consolidation are not likely to

abate. The owner of U.S. Foodservice (Ahold) acquired Alliant Foodservice in November 2001.

The role of food distributors has changed in grocery retailing as well, as has the rate of consolidation. However, the nature of these trends in retailing differs from that in the foodservice industry (see box on changing relationships).

### **Food Processors Lower Costs and Increase Variety**

Food processors are also adjusting their organizations in response to trends in consumer demand. For instance, an ERS study shows that poultry plants are using economies of scale to dramatically lower production costs. Between 1972 and 1992, the average plant quadrupled its production. As a result, average costs per bird slaughtered fell about 13 percent below the same figure for a plant with a capacity level typical of plants in 1972. In addition to lowering production costs, poultry plants have added operations to process their expanded production volumes into new products such as turkey cutlets, chicken nuggets, and other further processed products.

U.S. per capita poultry consumption increased from 27.8 pounds in 1960 to 78.8 pounds in 1999. Without this increase, the rapid growth of output per processing plant might have led to a significant decrease in the total number of plants and firms. Still, the four largest firms in poultry slaughter account for less than half of industry sales on a value basis. In the beef industry, processing plant sizes have also increased, but per capita consumption has not kept pace with rising productivity. Indeed, per capita beef consumption has shrunk approximately 30 percent since 1977. Consequently, the four largest beef processors now supply about 70 percent of the beef market on a value basis, compared with 26 percent in 1967.

## **Information, Precision, and Supply Chain Interdependence: Wal-Mart Sets the Trend**

*"The secret of successful retailing is to give your customers what they want. And really, if you think about it from your point of view as a customer, you want everything: a wide assortment of good quality merchandise; the lowest possible prices; guaranteed satisfaction with what you buy; friendly, knowledgeable service; convenient hours; free parking; a pleasant shopping experience."*

*Wal-Mart founder Sam Walton (1918-1992)*

In 1962, Sam Walton opened a small store in Rogers, Arkansas. By putting together linkages throughout the supply chain and using information to respond to change and cut expenses, Wal-Mart has since grown into the Nation's largest retailer of general merchandise. It has also been a leader in developing technologies and procedures to ensure that wide assortments of products are stocked on shelves at all times at economical prices. This industry leadership is demonstrated by Wal-Mart's use of scan-based trading and electronic funds transfer. Wal-Mart does not pay manufacturers for merchandise at the time a product is delivered. Instead, Wal-Mart pays the manufacturer when a product is scanned across the cash register at the point of sale. The manufacturer then receives an electronic message indicating both payment for the product and information about the change in retail stocks.

According to company literature, Wal-Mart also provides its suppliers with sales and other proprietary data to evaluate customer-buying patterns by store and region. Wal-Mart purchases goods from manufacturers based on the best-selling items at each store. Manufacturers and retailers separately forecast sales, share the forecasts, and then tailor order and deliveries.

Wal-Mart has brought its knowledge of general merchandise retailing to the food industry. The company operates "supercenters" that combine general merchandise departments with supermarket departments. These stores provide a large selection of foods to meet consumer preferences for economically priced, fresh, high-quality bakery items, meat, and produce. Quick product turnover is a key element to marketing fresh foods. Wal-Mart's automated order/delivery methods help ensure fresh product stocks and improve merchandise flow.



**Sam Walton applied business principles that made use of supply chain linkages and information technology to help guide Wal-Mart from a single store operation to the Nation's number one food retailer.**

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## Changing Relationships Between Food Distributors and Retailers

Food distributors and retailers are changing the way they interact with each other. Traditionally, distributors bought food from many manufacturers, organized and loaded the food onto trucks, and delivered the food to retailers. Today, an increasing number of food manufacturers deliver their own products directly to individual retail stores and arrange it on the shelves. Food products delivered directly by manufacturers tend to be beverages, sweets and salty snacks, bread, and ice cream.

Direct delivery programs are often complemented with ECR-based techniques, such as scan-based inventory management. Manufacturers that deliver directly to stores tend to favor scan-based trading because the system allows them to monitor store stocks and replenish diminishing stock in a timely manner. Retailers may also favor direct delivery and scan-based trading programs because they reduce instances of retail out-of-stocks. Delayed payment for goods offers retailers a further incentive to implement direct delivery programs. In such cases, retailers do not pay for products until they are sold and money is not tied up in slow-moving inventory.

Simultaneously, many retail chains now operate their own distribution centers. In 1999, 47 of the largest 50 food retailers, including Kroger, Wal-Mart, and Safeway, operated distribution centers. Products not delivered directly to individual retail stores are received at these companies' distribution centers and held as inventory. For example, Safeway operates a distribution center in Arizona that serves 103 Safeway stores in Arizona and 1 Safeway store in New Mexico. When the distribution center receives an order from one of these stores, it uses existing inventory to fill the order. Consolidated orders are filled and delivered to the stores in one of the center's own trucks. Orders placed by Safeway stores prior to 5 a.m. are filled by 10 p.m. on the same day.

While self-distributing food retailers may manage inventories more efficiently in some instances, traditional wholesalers still have a role in the industry. In addition to serving smaller retailers, traditional distributors could provide specialty foods to niche retailers. For example, Unified Western Grocers, the Nation's ninth largest food wholesaler, acquired a specialty wholesaler that caters to the growing Asian and Hispanic communities in California.

## Structural Changes Raise Policy Questions

Structural change is occurring along the food supply chain as companies individually and jointly move to answer consumer demand. These changes enable companies to profit as they provide consumers with the products they desire. Nonetheless, structural change often raises issues among policymakers: some have asked whether the evolving relationship between retailers, manufacturers, and distributors increases or hinders competitive behavior.

One key issue is whether the changing structure of food markets will lead to higher consumer prices, lower farm prices, or both. Markets with a large number of buyers and sellers are often believed to be the most competitive. In competitive markets, prices are kept as low as possible by the ability of buyers and sellers to trade with other multiple buyers and sellers.

By contrast, in imperfectly competitive markets, a seller may be able to exercise "market power" if it can raise its prices above the competitive level by restricting sales. For example, in highly consolidated retail markets, some have questioned whether grocery retailers might be able to exercise market power over consumers. Similarly, a buyer is said to have market power if it can influence prices paid for inputs by restricting its purchases of these inputs. For example, as meat processors have consolidated, some have asked whether processing plants might be able to reduce prices paid to ranchers and feedlots for cattle.

Researchers have found little empirical evidence of significant market power in most food markets. Nonetheless, as the food supply chain continues to evolve in response to consumer demand, this issue and other policy issues are not likely to disappear.

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# Farm Business Practices Coordinate Production With Consumer Preferences

Steve Martinez and David E. Davis

Consumer pressures placed on agriculture for variety, quality, and safety are affecting how the industry is organized, including the types of buying and selling arrangements within the food supply chain and the application of information technologies. Farm production is becoming more capital intensive, with emphasis placed on adding value to commodities. Product differentiation and quality control are becoming more essential at the farm level. In some agricultural industries, contract production is becoming more common as food processors and distributors attempt to gain greater control over their products and ensure market outlets. Some contract arrangements specify particular production practices, such as the use of specific genetic strains or organic farming techniques. In other types of contracts, the food processor gains greater control over farm products by providing important inputs, such as the animals, feed, and management services.

As contracts become more common, they replace traditional methods of buying and selling large supplies of homogeneous agricultural commodities. Traditionally, these products were conducive to buying and selling without prior commitments placed on producers, and with little control over the commodities by buyers. When the products were ready for sale, producers would take them to an auction market, terminal market, storage facility, or buying station and sell the products at the going market price in that region. Prices paid at these open, or spot, markets are referred to as spot prices.



As the share of farmers using the Internet continues to rise, high-tech service providers introduce tools designed specifically to help manage the business of agriculture, such as a Web-based system that enables farmers to map crop fields and develop field histories.

Credit: Digital Stock.

The extent of contracting varies widely across agricultural sectors (fig. 1). Nearly all poultry is produced under contract, but less than 15 percent of total grains are produced under contract. The changeover to contracting also varies by commodity. For example, in the broiler industry, contracting has been widely used since the 1950s and accounted for 93 percent of production by 1960. In the hog industry, increases in contracting are more recent. In grain markets, contracting represents a small, but growing, presence.

## Grain Contracting Becoming More Common

As consumer preferences become more diverse, the focus in agriculture is moving from selling large supplies of homogeneous products to selling more heterogeneous products. In grain contracting, significant growth opportunities are available through product differentiation. For example, ad-

vances in traditional grain-breeding technology over the past decade have enabled growers to meet the demands of buyers and produce value-enhanced grains (VEG) with specific quality characteristics. In terms of acreage, value-enhanced corn is the largest VEG market. Types of value-enhanced corn include white corn, food-grade yellow corn, and waxy corn. White corn is used almost exclusively in human food applications for products, such as chips, tortillas, and other corn-based foods. Food-grade yellow corn is used to make chips, grits, corn flakes, beer, and other food items. Waxy corn contains a special starch used in food products, such as salad dressings, pie fillings, and

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canned puddings. Other examples of VEGs include organically grown and chemical-free grains. According to the U.S. Grains Council, about 10.5 percent of U.S. corn acreage is devoted to the value-enhanced grain market.

Because specific types of high-quality VEGs are less likely to be available on the general market, processors may enter into contracts with producers to ensure a supply of a particular type of grain. For example, Frito-Lay contracts with farmers for specific types of corn for its Fritos Corn Chips. The company tracks the processed corn through all stages of the marketing process on a bag-by-bag basis to ensure product quality. Producers may also desire contract arrangements before growing specific types of grain. Specialized grains sell at a premium above open-market prices, and producers selling these grains on the open market would risk suffering significant financial losses. For example, white corn sold on average for \$0.33 per bushel more than common yellow dent corn in 2000.

According to the U.S. Grains Council, about 60-65 percent of white corn is grown under contract and the remainder is sold on the open market. In 2001, the share of food-grade yellow corn grown under contract reached 30-35 percent, compared with less than 25 percent in previous years. About 60-70 percent of waxy corn is produced under contract.

The VEG market is expected to grow over time as some end-users increase their demands for corn

and other grains that have not been grown from genetically engineered seeds. However, demand for transgenic seeds (seeds that have been genetically engineered) is also projected to grow, by 12 percent annually for the next 4 years, primarily in the United States, Canada, Argentina, and China. Many crops grown from transgenic seeds have specific agronomic features, such as insect or herbicide resistance.

While most of the advances in grain-breeding technology have enhanced agronomic properties, the next wave of genetically modified crops may have direct benefits for consumers. For example, nutraceuticals, or farmaceuticals, are plants that are genetically engineered to provide health benefits beyond basic nutrition, such as rice enhanced with vitamin A. These crops could provide vaccines or vitamins that replace the need for injections or pills. Medications and dietary supplements may be grown as specialty crops that taste and appear like traditional foods. Depending on consumer attitudes toward biotechnology, regulatory policies regarding nutraceuticals, and development of supporting distribution infrastructure, these new crops may accelerate the growth of contracting in the grain market.

### **Contracting in the Meat Industry Facilitates Quality Control and Traceback Capabilities**

In response to the success of branded poultry meats, several pork companies are supplying retailers with case-ready, branded meats. (Case-ready products are packaged, priced, and labeled by the processor for store display.) For example, Smithfield Foods produces Lean Generation Pork, an exceptionally lean, branded fresh pork product. Sales of Lean Generation increased ninefold over the past 4 years. Sales of all Smithfield case-ready pork items were nearly four times greater in 2000 than in 1999.

The production of case-ready, branded pork products may benefit

from greater control over breeding stock and improved hog management practices. For example, consistent genetic inputs can improve the degree of uniformity of hog size and weight that is required for standardized branded product packaging. Genetic inputs can also have an effect on specific hog quality attributes important to both fresh pork branding and pork exports to particular countries, such as Japan, the largest importer of U.S. pork. As hogs have become leaner over time, they have become more prone to stress and associated excitable behavior, which can result in more carcass bruising and pork that is tougher and less palatable after cooking. Handling methods that reduce stress in hogs and breeding practices that produce more docile hogs can improve both the taste and the quality of pork. Seaboard, a leading pork producer, uses specific genetic stock to grow hogs free from stress-related attributes for its Prairie Fresh brand.

Similarly, in the beef industry, improvements in beef quality require improved genetic stock and better cattle management. Since the 1980s, U.S. per capita beef consumption has declined, despite falling beef prices. In response to consumption decreases, the beef industry is addressing specific issues related to beef quality. A National Cattlemen's Beef Association (NCBA) survey of packers, further processors, retailers, foodservice operators, and consumers uncovered problems associated with quality of fresh beef products, such as excess fat, lack of tenderness, and inconsistency of meat cuts. According to a beef quality audit conducted by NCBA in 2000, the beef industry has two strategies for the future: (i) apply breeding and management techniques to improve marbling, weight and cut sizes, consistency, and other variables necessary for case-ready products; and (ii) help ensure delivery of predictable and uniform lots of cattle by implementing nutrition and health programs, and safe and humane handling techniques.

The success of branded poultry products has spurred several pork companies to supply retailers with case-ready, branded meats, the production of which may benefit from greater control over breeding stock and improved hog management practices.

Credit: Ken Hammond, USDA.



Food safety concerns pressure food companies to have more complete information on the sources of inputs in their products. According to the president of Smithfield Foods, retailers and foodservice operators have made food safety a major criterion for selecting meat suppliers. Hence, the ability of meat suppliers to provide more complete information about the origin of finished products has become a competitive advantage. The ability to traceback, or track an animal through the production process to locate a contaminating source, is critical to addressing food safety concerns.

The ability of processors to monitor production or control production inputs can facilitate meat quality improvements and traceback capabilities. Visual inspections of an animal do not enable processors to identify and verify the animal's genetic strain, how it was handled, whether it was fed organic grain, and other quality attributes. Consequently, meat processors may enter into contracting arrangements to gain additional control over animal production. Through contracts, processors can gain more information about the source of meat products.

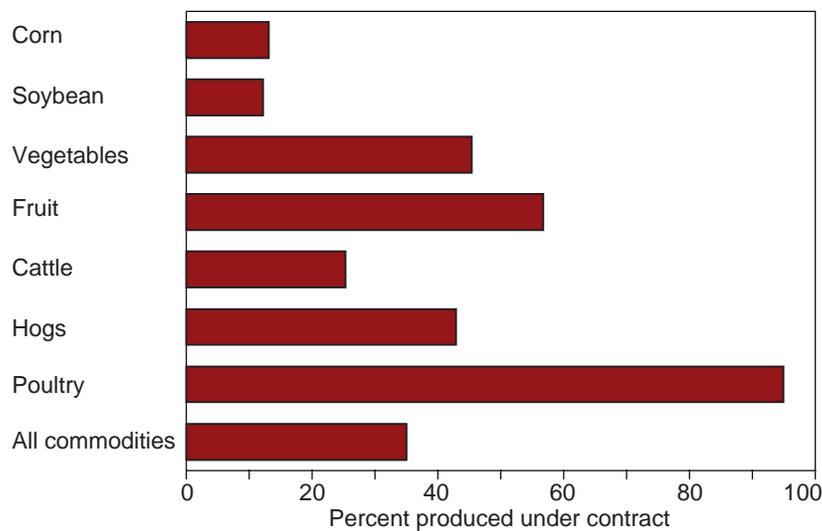
While contracting arrangements have been widely used in the poultry and egg sectors since the 1950s, increased use of contracting in the hog sector is more recent. Since the early 1990s, contracts between mostly large-scale producers and processors have become increasingly common in the hog industry (fig. 2). Contract terms typically specify that producers will deliver a certain quantity of hogs to processors at a certain date. Producers may receive a formula-based price, typically a hog price at a particular market location (for example, Iowa/Southern Minnesota), with premiums or discounts based on size and quality of the hogs. Processors also may specify that producers use certain types of inputs, such as specific genetic strains.

Other types of contracts used in the hog industry give processors more control over the quality of hogs by allowing the processors to provide key production inputs. As in similar arrangements in the poultry industry, pork processors may own the hogs and establish contracts with farmers to feed the animals to market weight. Processor-owned hogs increased in share from 6.4 percent of U.S. hog production in 1994 to 27 percent in 2001, in part reflecting Smithfield Foods' recent purchases of two

leading hog producers. Genetic strains for Smithfield's Lean Generation Pork were originally obtained through an alliance the company formed with a major hog producer, which involved contract production and joint ownership of hog operations.

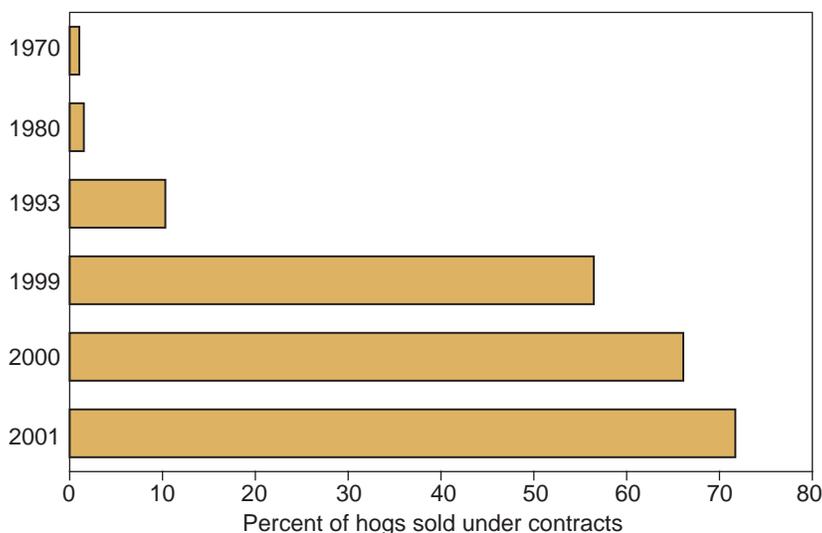
In the beef industry, some meatpackers enter into contracts with producers to obtain the volume of cattle possessing attributes necessary to meet specific customer demand. Difficulties in discerning quality attributes among live cattle

**Figure 1—Most Poultry Is Produced Under Contract, 1998**



Source: Perry and Banker.

**Figure 2—Contract Marketing of Hogs Has Surged Since the Early 1990s**



Source: Martinez; and Kelley.

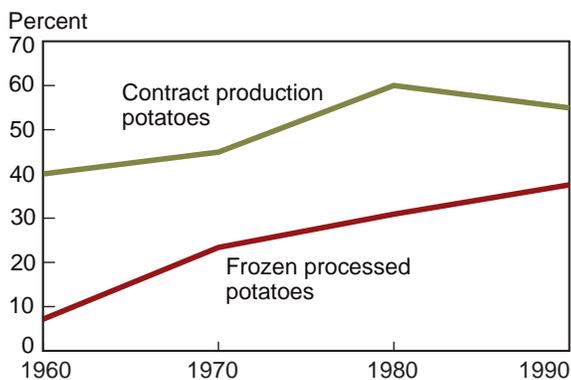
## Growth of Fast Food Restaurants Increases Potato Contracting

The potato industry exemplifies the effect that changing consumer demands can have on agriculture. The fast food industry emerged in the 1950s and experienced tremendous growth in the 1960s and 1970s. From 1963 to 1991, the number of fast food restaurant establishments in the United States increased from 39,680 to 193,392, nearly a fivefold increase. The growth of this industry was instrumental in the development of the frozen potato product. By transferring peeling, cutting, and blanching of potatoes from restaurant workers to processors, fast food restaurants lowered labor costs and assured supplies of french fries of greater consistency and value.

From 1955 to 1995, frozen potatoes as a share of all fresh and processed potato production in the United States increased from 1.7 to 42.3 percent. A mass market was created that supported growth and development of quality standards. Potatoes, particularly for french fries, require more irrigation, fertilizer, and other chemicals than many other crops.

As potato processing increased, contracts between processors and producers also increased (see figure). French fry processors require an assured supply of high-quality potatoes for meeting restaurant needs. McCain Foods, the largest french fry processor in the world, produces one-third of all french fries consumed in the world and at least 40 percent more than any other company. Most of McCain's potatoes are grown by producers that enter into contracts before the year's crop is planted. Agronomists employed by McCain work with the farmers to help improve the quality and yield of their crops. ConAgra, a large diversified food processing company, also negotiates annual contracts with potato growers and provides firm commitments and stable prices to growers that have made significant capital investments.

**Fast Food Industry Growth Led to Rise in Frozen Processed Potatoes and Potatoes Produced Under Contract**



Source: Marion; Martinez and Reed; and U.S. Department of Agriculture.

increase the incentives for processors to establish closer relationships with producers through contracting. Cattle producers that control genetics and improve cattle management techniques also have an incentive to enter into long-term contracts to ensure premium prices for higher quality cattle. In 1999, the share of cattle bought under contracts or fed and owned by beef packers was 32 percent of the total annual slaughter of the four largest beef processors.

## Contracting Becomes More Common in Fresh Produce Industry

As evidence that Americans have become more health conscious, annual fresh fruit and vegetable consumption in the United States increased by 49 pounds per person between 1986 and 1999. Rising per capita incomes have increased consumer demand for a greater variety of fresh fruits and vegetables. For example, tomato offerings, once limited to mature green and vine-ripe tomatoes, now include extended-shelf-life, grape, yellow, red baby pear, cluster, greenhouse, organic, and heirloom varieties.

Since the 1960s, more than half of all citrus fruits and processed vegetables in the United States have been produced under contract. Contracts give vegetable processors additional control over production decisions, such as growing practices and planting dates, and help ensure processors receive a regular flow of raw product with desirable traits (see box on potato contracting).

More recently, contracting arrangements have increased in the fresh fruit and vegetable industries. In joint ventures between packer/shippers and farmers, contracts enable packer/shippers to control planted acreage, planting dates, and growing practices. In many cases, packer/shippers grow their own vegetables to gain further control over quality and product flows. Volume requirements of supermarket chains and other

large fresh produce buyers, such as suppliers of branded fresh packaged salads, have created growing interest in contracting as a means of procuring the desired volume, size, variety, quality, and consistency of product.

## Farmers Organize To Coordinate Production With Consumer Preferences

A rising number of farmers are using information technology to keep pace with changing consumer demands. Between 1997 and 2001, the share of farms with Internet access increased from 13 to 43 percent, and the share of farms using computers for business purposes increased from 20 to 29 percent. Furthermore, a recent USDA Economic Research Service survey shows that 15 percent of farms with Internet access have used computers to conduct e-commerce transactions.

High-tech service providers have taken notice of the increasing number of farmers with access to the Internet. Some technology-based companies have designed tools to help farmers track products through the production process. These companies often provide marketing services along with identification and data management services. For example, Farmland Industries, Inc. offers Farmland Dedicated Grains, a Web-based system that allows producers to map crop fields and develop field histories. The system also enables buyers to view the results of independent grain sample tests on the Dedicated Grains Web site. Another company, eMerge Interactive, offers a service that enables producers to market feeder cattle over the Internet and manage cattle data. Producers that use the company's Web-based data management system, CattleLog, can upload data and access reports with hand-held devices that read electronic identification tags on cattle. eMerge Interactive's cattle identification system allows for unique meat-branding opportunities through traceback functions that help determine feed-



ing regimes and other unique production methods. Recently, an alliance of 11 Kansas feedlots began using eMerge CattleLog to select feeder cattle for purchase.

Another means of coordinating farm production involves third-party verification or certification of a product's quality attributes. For example, third parties certify or verify products that will carry eco-labels before the products are sold to consumers. Eco-labels are seals or logos that indicate a food product meets a set of environmental or social standards, such as "dolphin-safe," "environmentally friendly," or fair trade certified. Starbucks currently sells fair trade certified coffee, which is grown by small-scale farmer cooperatives. Safeway recently agreed to begin selling fair trade certified coffee, which marks the product's first national distribution in supermarkets.

The American Humane Association has developed the Free Farmed program to certify that animals have been raised under humane conditions. Such certification programs may become increasingly important as the food industry makes further attempts to appeal to the social consciousness of consumers. The top three U.S. restaurant franchises, accounting for approximately 35 percent of franchised restaurant sales, place restrictions on how animals used in the companies' foods are produced. In 2000, McDonalds issued animal welfare guidelines for egg produc-

ers that supply the fast food company. McDonalds also has guidelines for cattle and hog processors that cover processing stages from delivery to slaughter. McDonalds' guidelines have apparently served as models for other restaurants and retailers, including Burger King, Wendy's, and Kroger.

USDA recently released rules for implementing organic product standards. These regulations require that all growers and handlers, except for the smallest, be certified by a State or private agency under uniform standards developed by USDA. These standards relate to production practices and substances used in producing and handling crops, livestock, and processed agricultural products.

In response to changing consumer demands for food, and to capture the value added to products by further processing, some farmers are turning to "new generation cooperatives." These cooperatives allow farmers to control food production through more than one stage of production and marketing, usually through some level of processing. In many cases, forming a cooperative allows farmers with limited capital to build and operate a processing facility. The Dakota Growers Pasta Company is a new generation cooperative formed by Upper Great Plains wheat growers to capitalize on pasta's popularity with U.S. consumers. The company owns a processing plant that processes durum wheat into flour,

pasta, and millfeed. Producers of eggs, bison, soybeans, ethanol, wine, and many other agricultural products have also formed new generation cooperatives.

In the beef industry, U.S. Premium Beef is a cooperative formed by beef producers and a processing company. The cooperative has its own beef pricing system, which provides incentives for producers to raise cattle with desirable attributes. Cattle producers own shares in the cooperative, which owns a partial share of the beef processing company. The processing company markets the beef under its own brands, including Farmland and Black Canyon Cattle Company.

Domestic demand for food products is expected to grow slowly over the next 20 years. In this situation, a food company's growth depends on lowering production costs, differentiating its products, producing higher quality products at economical prices, or expanding international trade and investments (see "U.S. Food Sector Linked to Global Consumers" elsewhere in this issue). Trends in consumer preferences and food industry pressures to compete for consumer food spending extend back to agriculture. Coordination between agricultural production and value-added processes, including processing and distribution, is key to providing consumers with products that meet their demands for quality and variety. These developments will likely require farmers to become more in-

**Since the 1960s, over half of all U.S.-grown citrus fruits have been produced under contracts.**

**Credit: Ken Hammond, USDA.**

Advances in grain-breeding technology have enabled farmers to achieve growth by producing crops, such as value-enhanced corn, with specific quality characteristics.

Credit: Digital Stock.



terdependent participants in the food supply chain, perhaps giving rise to contracting and other forms of organization in agriculture.

These developments, however, are not without controversy. Efforts to respond to consumer demand for increasingly differentiated food products through biotechnology raise ethical, food safety, and environmental issues. Contracting is also an issue of contention, especially among small farmers that may not have the output volume necessary to warrant contracts with large processors. As contracting increases and spot-market trading decreases, spot-market prices become more vulnerable to manipulation and volatility as fewer buyers and sellers account for a larger percentage of the trade. Decisions by government policymakers regarding these issues can have an important influence on the future direction and pace of efforts by farmers, processors, and distributors to coordinate farm production with increasingly discerning consumer preferences.

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# U.S. Food Sector Linked to Global Consumers

Anita Regmi and Greg Pompelli

The fortunes of U.S. farmers and food processors are increasingly influenced by events in markets around the world. The importance of trade is not new, but as world economies become more interrelated, U.S. agricultural and food processing sectors become more heavily affected by changes in global markets. One of the critical influences on the U.S. food sector is rising incomes and related changes in the diets of consumers around the world.

Many factors determine food purchases, including age, household size, ethnicity, education, geographic location, access to technology, and health attitudes. Nonetheless, income remains the factor with the greatest influence over dietary changes, as it provides the means needed to convert desired-demand for goods into effective-de-

mand for goods. Recent research by USDA's Economic Research Service (ERS) shows that as incomes rise around the world, consumption patterns change in affected countries. Income-initiated dietary changes in high-income nations are relatively small, compared with income-initiated dietary changes in lower-income nations. The World Bank defines high-income countries as those with 1998 per capita Gross National Product (GNP) above \$9,360, middle-income countries as those with 1998 per capita GNP between \$760 and \$9,360, and low-income countries as those with 1998 per capita GNP below \$760. Countries in the low- and middle-income groups are generally considered to be developing countries.

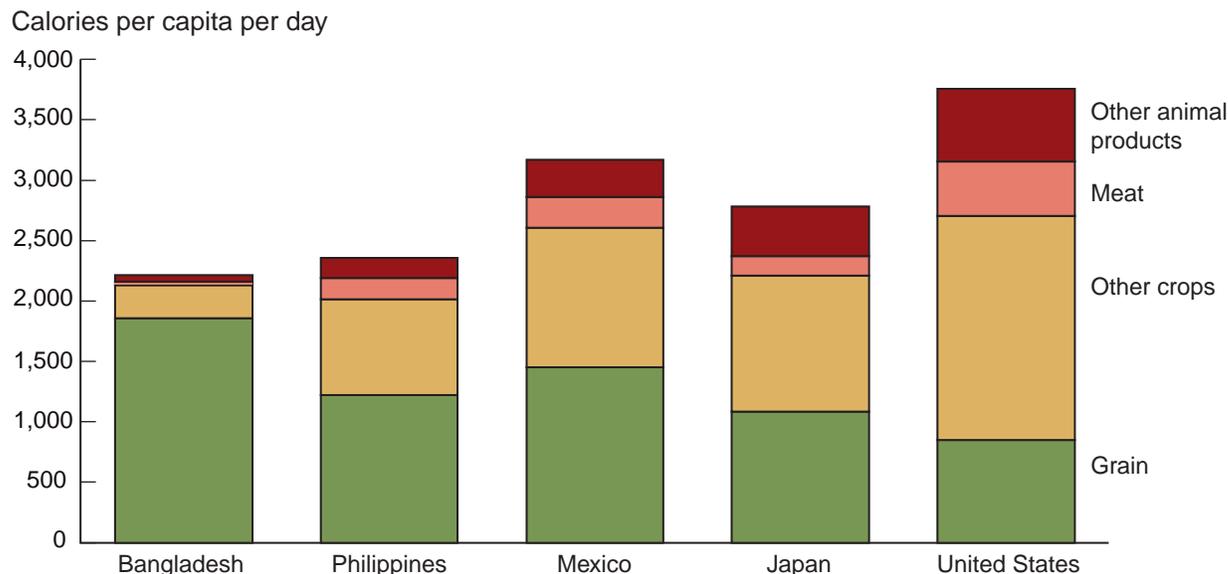
In countries at low-income levels, such as Bangladesh, consumer

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demand for food is driven by the need for individuals to meet basic caloric requirements, leading to diets mainly comprising carbohydrate-rich products, such as cereals (fig. 1). Increases in income at this level may lead consumers to increase consumption of calorie-rich carbohydrates. In countries at higher income levels, such as the Philippines and Mexico, consumers can readily meet their caloric needs and the demand for food is often shaped by taste, cultural trends, and other social factors, such as increased number of women working

Figure 1—Grains Are the Primary Sources of Calories in Low-Income Countries



Source: The United Nations Food and Agriculture Organization's FAOSTAT database, 2001.



**Staple food products, such as cereals, account for a larger share of the total food budgets in low-income countries, where consumer demand for food is driven by the need to meet basic caloric requirements.**

**Credit: ERS.**

outside their homes. Income growth among consumers in these countries may lead them to substitute staple foods with more expensive sources of calories, such as meat and fruits and vegetables, and products popularized by cultures in developed countries.

In countries at yet higher income levels, such as the United States, Japan, and Western Europe, consumer demand for food may be influenced by demand for leisure and other social concerns. Affluent consumers at this level of income can easily meet their nutrient needs, and income growth raises food expenditures through purchases of more expensive foods, not larger quantities of food. Food expenditures increase as consumers pay higher prices for labor-saving, ready-to-eat products or for products produced in manners consistent with consumers' social values (such as concern for the environment or animal welfare).

Recent ERS analyses of 1996 International Comparison Project data indicate that low-income countries spend about 47 percent of their total budgets on food, compared with richer countries that on average spend about 13 percent of total budgets on food. Staple food products, such as cereals, account for a larger share of the total food budget in low-income countries. Also, food purchases by consumers in low-income countries are more responsive to food price and income

changes. For example, for every dollar increase in income, consumers in Tanzania, a low-income country, spend about \$0.54 on additional food purchases, while consumers in the United States, a higher income country, spend \$0.02 on additional food (table 1). Low-income country responses to food price changes, however, may not always be perceptible because consumers in those countries are likely to substitute lower priced products within a food group when prices rise. For example, when the price of wheat increases, low-income consumers may substitute corn for wheat, while many middle-income consumers may switch to products outside the cereal group, such as meat or horticultural products. For high-income consumers, food is a small part of the total household budget, and food price changes may lead to small or no adjustments in the composition of food consumed.

### **Meats and Fruits and Vegetables Substitute for Low-Value Staples**

How a country's income is distributed has important implications for changes in a country's food purchases and trade. When a developing nation's income is held by a wealthy minority of the population, increases in national income may not translate into effective demand for different foods. Richer citizens may spend their higher in-

come on vacations and other leisure activities, while poor citizens are likely to use their income increases to buy more meat or fruits and vegetables. In developing nations with more even distribution of income, national income changes have a greater effect on food demand as the shifting food preferences, however slight, are magnified by a much larger portion of the population. Thus, increased incomes for large shares of populations in lower income nations offer greater potential trade opportunities for producers of high-valued foods and the ingredients used to make those products.

Urbanization and improved transportation and infrastructure facilities have greatly contributed to changes in global food consumption and trade patterns. Per capita food availability on a global basis increased from about 2,300 calories per day in 1961 to almost 2,800 calories per day in 1998. In addition to changes in food availability, the basic sources of calories have changed, with animal and horticultural products accounting for a growing share of total calories consumed at the expense of root and tuber crops, such as cassava and sweet potatoes (table 2). Per capita global availability of meat and fruit and vegetables increased more than 60 percent between 1961 and 1998, while the supply of roots and tubers decreased over 21 percent. World cereal supplies increased almost 17 percent during the same period.

In high-income countries, per capita food supplies (an indication of consumption) of both cereals and roots and tubers decreased between 1961 and 1998, while the supplies of meat and produce increased substantially. With the exception of supplies of roots and tubers, food supplies substantially increased in middle-income countries over the same period. In low-income countries, where hunger remains a concern despite recent economic gains, decreases in root and tuber supplies were more than offset by significant increases in per capita supplies of all other food

types between 1961 and 1998. Cereal supplies increased almost 32 percent in low-income countries and 12 percent in middle-income countries. These increases can be partially attributed to increased demand for livestock feed, resulting from the increased demand for meat.

Between 1961 and 1998, per capita meat supplies increased over 300 percent among low-income countries, from 11.7 to 48.9 pounds, and about 75 percent among middle-income countries, from 50.0 to 87.7 pounds. Per capita meat supplies among high-income countries rose 58 percent over the same period, from 119.5 to 189.2 pounds. The income elasticity for meat—a measure of the responsiveness of the quantity of meat demanded to a change in income—is higher for poorer countries. Thus, when income increases 1 percent in both low- and high-income countries, poorer countries increase their expenditures on meat by a larger amount than wealthier countries (fig. 2). For example, following a 1-percent increase in income, con-

sumers increase their expenditures on meat by 0.86 percent in Tanzania, 0.72 percent in Thailand, 0.58 percent in Argentina, and 0.22 percent in the United States.

Similarly, poorer nations exhibit greater responsiveness in produce consumption to income and produce price changes. For example, following a 1-percent decrease in fruit and vegetable prices, consumers increase their expenditures on produce over 1 percent in Tanzania, 0.86 percent in Morocco, and 0.08 percent in the United States (fig. 3).

### U.S. Food Sector Faces Competition in Growing World Economy

Although rising global incomes strengthen the influence of global consumers on food demand, especially consumers in low- and middle-income countries, these gains in income do not necessarily translate into guaranteed gains for the U.S. food sector. Local agricultural industries in these countries have the ability to produce some of the

goods consumers demand as diets change due to income growth. As countries meet their increased needs for high-value foods, U.S. exports of those foods face increased

**Table 1—Poorer Countries Spend More of Additional Income on Food**

Countries	Food expenditure from \$1 additional income
<i>Dollars</i>	
Tanzania	.54
Indonesia	.31
Albania	.30
Philippines	.27
Venezuela	.25
Turkey	.21
Mexico	.20
Poland	.19
South Korea	.13
Greece	.11
France	.07
Canada	.05
United States	.02

Source: Estimated by USDA's Economic Research Service based on 1996 International Comparison Project data.

**Table 2—World Supply of Meat and Produce Has Risen**

Countries	1961	1970	1980	1990	1998	Change, 1961-98
<i>Pounds per capita</i>						<i>Percent</i>
<b>Cereals:</b>						
Low-income countries	283.3	326.7	346.3	381.6	373.5	31.8
Middle-income countries	275.6	288.8	308.4	313.5	308.2	11.8
High-income countries	269.6	246.3	236.6	238.2	248.9	-7.7
World	298.3	317.0	329.8	352.8	348.8	16.9
<b>Roots and tubers:</b>						
Low-income countries	45.2	47.2	40.1	32.6	35.5	-21.5
Middle-income countries	32.2	31.1	27.3	25.8	28.9	-10.2
High-income countries	38.4	34.0	32.2	32.2	32.6	-15.1
World	41.9	42.1	35.9	30.9	32.8	-21.7
<b>Fruits and vegetables:</b>						
Low-income countries	158.3	113.6	143.3	200.2	240.0	51.6
Middle-income countries	259.0	282.9	332.5	345.9	356.9	37.8
High-income countries	336.6	390.0	411.8	476.6	493.2	46.5
World	223.8	228.8	246.5	218.7	373.0	66.7
<b>Meat:</b>						
Low-income countries	11.7	16.8	22.0	32.4	48.9	317.9
Middle-income countries	50.0	59.3	74.1	83.1	87.7	75.4
High-income countries	119.5	142.9	167.8	177.9	189.2	58.3
World	54.0	62.8	71.0	74.1	86.9	60.9

Note: The world average may not necessarily reflect the average of the three country groupings because many of the former Soviet and Yugoslav countries are excluded in the groups.

Source: United Nations Food and Agriculture Organization Food Supply Data, 2001. Countries are grouped according to the World Bank definition.

competition; however, demand for ingredients used to produce these foods may increase. For example, growing feed needs in livestock sectors around the world, due to growth in global meat demand, have resulted in increased U.S. soybean exports.

Growth in global meat demand has also expanded trade in meat products, including exports of U.S. meats. For example, U.S. meat exports have increased to the Philippines, Mexico, and Japan. These countries reflect a broad range of incomes and development. As their

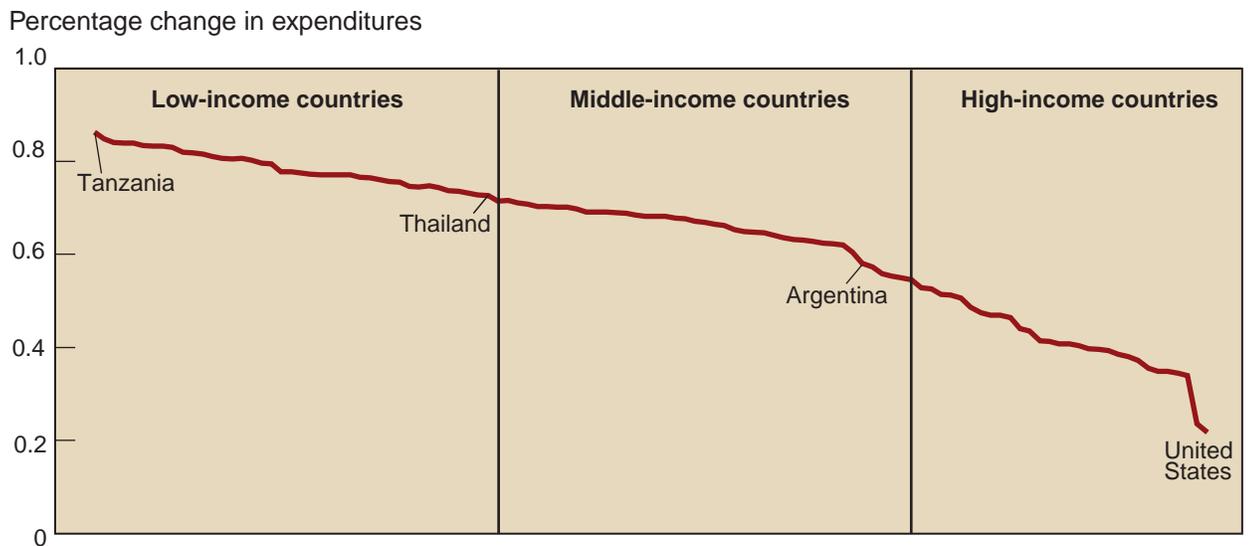
economies have grown, composition of U.S. exports to the countries has also changed (fig. 4). Although other factors influence food export levels, income-initiated dietary changes among consumers, particularly in the Philippines and Mexico, have caused red meat and poultry to grow in share, in terms of value, of U.S. agricultural exports to these countries.

As countries have prospered, particularly countries in Asia, they have also expanded domestic meat production (table 3). Expansion of meat production has led to in-

creased global demand for feed grains, with many countries turning to imports to meet their feed needs. For example, feed imports by China increased almost 70 percent in value during 1992-2000, while imports by Mexico increased almost threefold during the same period. The United States is a major feed grains supplier but must compete with firms from other nations, such as grain-rich countries in North and South America, for export sales.

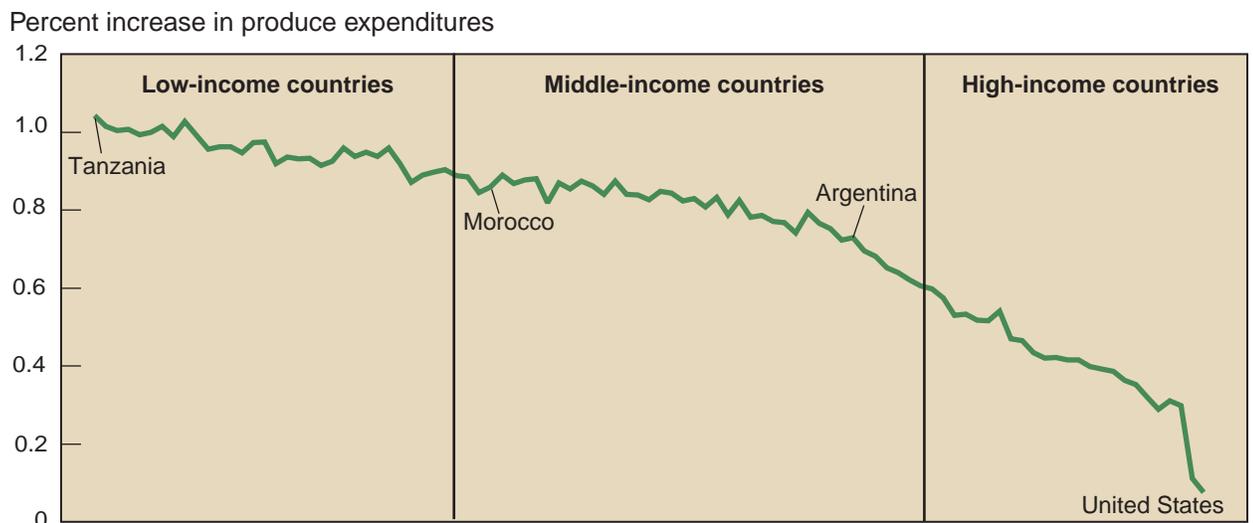
When U.S. firms compete in international markets, international

**Figure 2—Poorer Countries Have Larger Increases in Meat Expenditures With 1-Percent Increases in Income**



Source: Estimated by USDA's Economic Research Service based on 1996 International Comparison Project data.

**Figure 3—Poorer Countries Make Bigger Expenditure Increases for 1-Percent Decrease in Produce Price**



Source: Estimated by USDA's Economic Research Service based on 1996 International Comparison Project data.

standards of competitiveness replace local/national comparisons, and prices paid for agricultural commodities often reflect these standards. A major concern of U.S. producers is that globalization will lead to decreased market shares and increased price pressures on domestic commodities. For example, fresh citrus producers worry that the increased availability of fresh citrus from Australia, Israel, and Spain has led to a decline in their share of the domestic market. Citrus growers feel the increased availability of imported fresh fruit, especially in winter months when fruit from the Southern Hemisphere is also in season, has placed downward pressure on the prices they receive. At the same time, the United States exports a significant share of the fresh citrus crop each year. In 2000, U.S. citrus growers exported over a third (37 percent) of the fresh grapefruit crop, more than a fifth (22 percent) of the fresh lemon crop, and over a quarter (27 percent) of the fresh orange crop. Thus, export revenues for fresh citrus are an important contribution to growers' returns.

### Macroeconomic Factors Complicate Global Prospects

Foreign markets will be one source of future sales growth for the U.S. food sector. Hence, global macroeconomic conditions are important along with domestic market conditions. Changes in global macroeconomic factors, such as economic growth rates of U.S. trading partners and currency exchange rate levels, can overshadow increased global consumer interest in U.S. food products and ingredients. Slowing economic growth can temper demand for food, especially high-value products, and U.S. products become more expensive in other countries when the U.S. dollar appreciates against local currencies.

U.S. domestic macroeconomic conditions also affect U.S. food export prospects. Because the United States accounts for about a quarter of the world's economic activity, the

health of the U.S. economy affects the rest of the world's economies, especially those nations that export goods and services to the United States. The recent U.S. slowdown provides evidence of the U.S. economy's effect on growth around the world. Slower U.S. growth had led to a drop in U.S. imports and slowdowns in the economies of nations that rely on U.S. purchases. Reduced sales of goods to the United States means that countries have fewer funds to buy U.S. foods and ingredients.

Just as increased global growth generates marketing opportunities for U.S. exports, slower global growth reduces trade opportunities and changes the composition of U.S. agricultural exports. For example, during the Asian financial crisis in the late 1990s, Asian households increased rice consumption and reduced purchases of high-value foods. This consumption pattern change adversely affected exports to Asian countries, a major market for U.S. food products. Reduced sales to Asian markets resulted in U.S. agricultural exports declining 23 percent in real terms between 1997 and 1999. Once the financial crisis passed and Asian



economies began to grow again, Asian consumers returned to diets with greater amounts of high-value products and U.S. exports to the region increased.

Relative exchange rates also affect trade opportunities because exchange rates affect prices faced by importers. Thus, a strong (appreciating) dollar can reduce the ability of the U.S. food sector to compete in global markets and increase opportunities for competitors. For example, between 1996 and 2001, U.S. soybean prices at Gulf of Mexico

**Growing feed needs in livestock sectors around the world, due to growth in global meat demand, have resulted in increased U.S. soybean exports.**

Credit: ERS.

**Table 3—Meat Production Expanded More Rapidly in Developing Countries Since 1980**

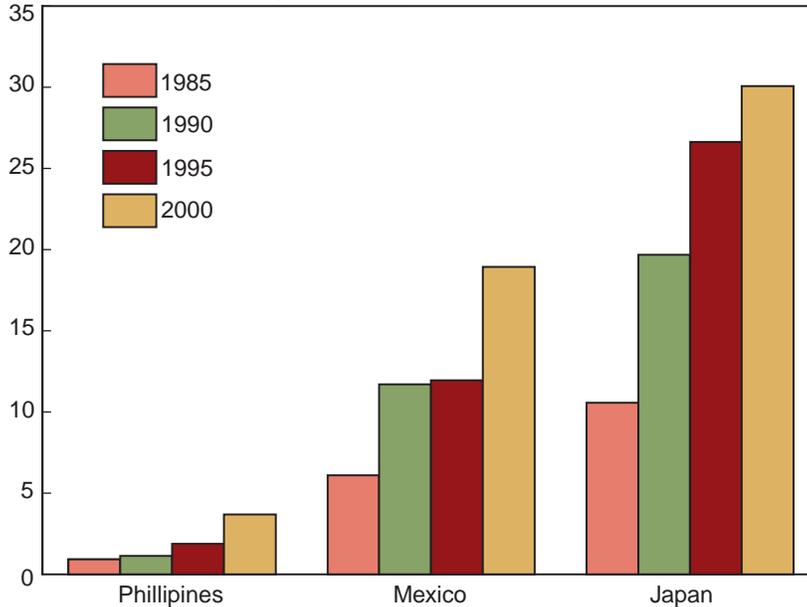
	Share of world total			Annual change 1980-98
	1980	1990	1998	
	<i>Percent</i>			
North America	20	18	18	2.13
Western Europe	22	19	16	1.14
Oceania	3	2	2	1.44
Total high-income OECD	45	39	36	1.61
East and Southeast Asia	4	4	5	4.97
South Asia	3	3	3	4.07
China	11	17	26	8.09
Near East	2	3	3	3.99
Asia and Near East	19	27	38	8.00
South America	9	9	10	3.28
Rest of world	27	25	16	-.29
World	100	100	100	2.76

Note: OECD denotes member countries of the Organization for Economic Co-operation and Development.

Source: United Nations Food and Agriculture Organization FAOSTAT database.

**Figure 4—Meat Exports Account for a Growing Share of Total U.S. Agricultural Exports to Selected Countries**

Meat share of total U.S. agricultural exports



Source: *Foreign Agricultural Trade of the United States*, USDA's Economic Research Service.

ports, prices traditionally used to approximate U.S. export prices, fell from \$7.88 to about \$5.35 per bushel. However, when traders converted U.S. soybean prices into Korea's currency, the won, U.S. soybean prices actually increased almost 8 percent during August 2001 because Korea's currency depreciated against the dollar at a higher rate than U.S. prices declined.

### Global Consumers Important to Future U.S. Food Sector Growth

Global per capita GDP grew about 2.6 percent in the 1990s, with low- and middle-income countries registering higher growth rates of 4 percent and 3 percent, respectively, and high-income countries registering growth rates of 2 percent. Increased purchasing power among consumers in developing countries has been accompanied by faster rates of population growth in these countries compared with developed countries, leading to greater demand for food.

Although developed countries also experienced income growth and slight increases in population, growth in food demand in these countries is smaller relative to developing countries.

In addition to increased demand for food, developing countries will also undergo changes in the composition of food demanded. The developing countries, which accounted for about one-half of the world's urban population of 1 billion in 1960, are expected to account for over four-fifths of the world's urban population of almost 5 billion in 2020. Along with urbanization, income levels, education, lifestyles, and food availability are expected to change in developing countries, resulting in greater demand for variety and labor-saving food products.

Therefore, future economic prospects for the U.S. food sector will be partially tied to income gains in low- and middle-income nations. Consumers in high-income nations around the world will con-

tinue to purchase U.S. goods, but the changes in consumption patterns will largely reflect consumer preferences for quality and labor-saving products, and not increased consumption. Rising incomes in low- and middle-income countries, however, will generate increased demand for many food products and create significant market opportunities for the U.S. food sector because even small dietary changes will aggregate into large changes in demand, as each change will be multiplied by millions of people. International competition and macroeconomic events may cloud the gains, but changing global consumer demand will be an important component of future gains in the U.S. food sector.

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# Food Assistance Expenditures Increase in 2001

Victor Oliveira

In fiscal 2001, Federal expenditures for domestic food assistance programs grew 4 percent, to \$34 billion, the first increase in annual food assistance expenditures since fiscal 1996 (fig. 1). The Food Stamp Program accounted for much of the increase in fiscal 2001 expenditures, as declining economic conditions in the United States increased the number of people receiving food stamps. However, nearly all of the individual programs comprising the Nation's food assistance system expanded to varying degrees in fiscal 2001.

USDA's Food and Nutrition Service administers an array of food assistance programs that differ by size, target population group, and type of benefits provided (see box). The goals of these programs are to provide needy persons with access to a more nutritious diet, to improve the eating habits of the Na-

tion's children, and to help America's farmers by providing an outlet for the distribution of food purchased under farmer assistance authorities. Five programs—Food Stamp Program, National School Lunch Program, Special Supplemental Nutrition Program for Women, Infants, and Children (commonly known as WIC), Child and Adult Care Food Program, and School Breakfast Program—together account for 92 percent of all Federal Government expenditures for food assistance.

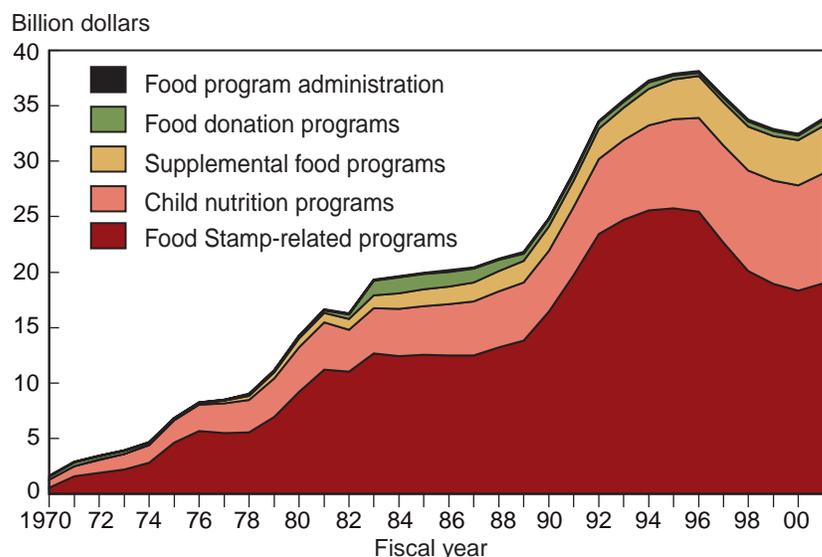
This article discusses how each of the individual programs expanded or contracted in fiscal 2001 (October 2000 through September 2001). The data cited in this article are based in part on preliminary data submitted by various reporting agencies as of November 2001 and are subject to change as reporting agencies finalize data.

## Food Stamp-Related Programs

The Food Stamp Program is the Nation's principal nutrition assistance program, accounting for over half of all food assistance expenditures in fiscal 2001. Unlike the other nutrition assistance programs that target specific groups, the Food Stamp Program is available to most households (subject to certain work and citizenship requirements) that meet income and asset criteria. The Food Stamp Program is an entitlement program, which means that all people who meet the eligibility requirements are automatically entitled to participate in the program. Expenditures for the program increase or decrease to meet the costs of serving the number of people who apply and are eligible to receive benefits. As a result, the program adjusts quickly to changes in economic conditions, expanding to meet increased need when the economy is in recession and contracting when the economy is growing and job opportunities and wages are favorable.

An average 17.3 million people per month participated in the Food Stamp Program in fiscal 2001, about 1 percent more than the previous year but still 37 percent fewer than in fiscal 1994 when participation peaked at 27.5 million people per month (fig. 2). Fiscal 2001 marked the first increase in the number of food stamp participants in 7 years. The increase in

Figure 1—Food Assistance Expenditures Increased In Fiscal 2001



Source: USDA's Food and Nutrition Service.

## Domestic Nutrition Assistance Programs

During fiscal 2001, USDA's domestic food assistance programs served an estimated one in six Americans at some point during the year. Each food assistance program targets different populations with different nutrition needs. Some individuals and households may participate in more than one program. Together, these programs provide a nutritional safety net to people in need.

The cornerstone of USDA's nutrition assistance programs, the *Food Stamp Program*, helps low-income households buy the food they need for a nutritionally adequate diet. The program provides monthly benefits for eligible participants to purchase approved food items at approved food stores. The Food Stamp Program is available to most households (subject to certain work and immigration status requirements) that meet income and asset criteria. Eligibility and benefits are based on household size, household assets, and gross and net income (gross monthly income cannot exceed 130 percent of the poverty guidelines).

In the past, nearly all households participating in the program received monthly allotments of coupons that were redeemable for food at authorized retail food stores. However, over 84 percent of all food stamp households now receive their benefits by an Electronic Benefits Transfer (EBT) card system (all States must convert to EBT systems by October 2002). The amount of a household's monthly food stamp allotment is based on USDA's Thrifty Food Plan, a market basket of suggested amounts of foods that make up a nutritious diet and can be purchased at a relatively low cost.

The Federal Government pays for all benefits issued through the program and shares the costs of the administration of the program with the States. (Expenditures cited in this article refer to only those borne by the Federal Government.)

In lieu of the Food Stamp Program, Puerto Rico, the Commonwealth of the Northern Mariana Islands, and American Samoa receive block grant funds that allow these U.S. Territories to operate food assistance programs designed specifically for their low-income residents. The Food Stamp Program in Puerto Rico was replaced in 1982 by the *Nutrition Assistance Program*. In the same year, the Nutrition Assistance Program for the Northern Marianas was started. The program for American Samoa started in 1994.

The *National School Lunch Program* provides lunches to children in public schools, nonprofit private schools, and residential child care institutions. Schools receive cash and some commodities from USDA to offset the cost of food service. In return, the schools must serve lunches that meet Federal nutritional requirements and offer free or reduced-price lunches to needy children. Any child at a participating school may enroll in the program. Children from families with incomes at or below 130 percent of the Federal poverty level are eligible for free meals, and those from families between 130 and 185 percent of the poverty level are eligible for reduced-price meals. Children from families with incomes over 185 percent of the poverty level pay a full price, though their meals are still subsidized to some extent. (Effective from July 1, 2001, through June 30, 2002, a family of four with an annual income at or below \$22,945 is eligible for free meals and a family of four with an annual income at or below \$32,653 is eligible for reduced-price meals.)

The *School Breakfast Program* provides low-cost breakfasts to school children, with students from low-income families receiving free or reduced-price meals (eligibility is the same as that for the National School Lunch Program). USDA provides schools with cash assistance to offset the cost of food serv-

ice. In return, the schools must serve breakfasts that meet Federal nutrition standards. As an incentive for schools in low-income areas to participate in the program, USDA provides schools with higher "severe needs" reimbursement rates if a specified percentage of the schools' meals are served free or at a reduced price and if meal preparation costs exceed the standard reimbursement rates.

The *Child and Adult Care Food Program* provides healthy meals and snacks to children in participating child care centers and in family and group day care homes as well as to adults in adult day care centers. In child care and adult day care centers, children and adults from low-income families are eligible for free or reduced-price meals based on the same eligibility guidelines used in the National School Lunch Program and the School Breakfast Program. Two sets of meal reimbursement rates are used for family day care homes. Those providers located in low-income areas, or whose own households are low income, are reimbursed at tier I rates, while other day care home providers are reimbursed at lower tier II rates. In tier II homes, providers serving meals to children who are identified as coming from households with incomes below 185 percent of the Federal poverty level are reimbursed at the higher tier I rate.

The *Summer Food Service Program* provides free meals to children (age 18 and under) and handicapped people over age 18 during school vacations in areas where at least half of the children are from households with incomes at or below 185 percent of the Federal poverty guidelines. There is no income test for eligibility in these low-income areas; any child in the program's operating area may participate. The program is operated at the local level by sponsors who are reimbursed by USDA. Sponsors not in low-income areas may participate

in the program if at least half of the children sponsored are from families with incomes at or below 185 percent of the Federal poverty guidelines (based on income applications collected from program participants). All children at these sponsor sites may receive free meals.

The *Special Milk Program* provides funding for milk in public and nonprofit schools, child care centers, summer camps, and similar institutions that do not participate in any other federally assisted nutrition program. Participating sites provide milk either free or at low cost to all children. These sites may elect to serve free milk to children from families with incomes at or below 130 percent of the Federal poverty level.

The *Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)* provides nutritious supplemental foods, nutrition education, and health care referrals at no cost to low-income pregnant and postpartum women, as well as infants and children up to their fifth birthday who are determined by health professionals to be nutritionally at risk. To be eligible for WIC, family income must fall below 185 percent of the Federal poverty guidelines (although States can set lower income limits, none currently do). Participants can redeem WIC food vouchers at retail food stores for specific foods that are rich in the nutrients typically lacking in the diets of the target population. WIC food packages include combinations of the following foods—iron-fortified infant formula, iron-fortified infant and adult cereal, vitamin C-rich fruit and/or vegetable juice, eggs, milk, cheese, peanut butter and/or dried beans or peas. Physicians or health professionals may also prescribe special infant formulas and certain medical foods for WIC participants with specific medical conditions.

The *Commodity Supplemental Food Program* provides nutritious

supplemental foods at no cost to infants and children up to their sixth birthday and pregnant and postpartum women, at or below 185 percent of the Federal poverty level, who are not served by WIC. The program also serves people age 60 or over with incomes not greater than 130 percent of the poverty guidelines. States have the option to require that participants be nutritionally at risk to qualify for the program. The program provides food packages (instead of vouchers) tailored to the nutritional needs of the participants. The program operates in parts of 18 States and the District of Columbia.

The *Food Distribution Program on Indian Reservations* provides commodities to low-income households living on participating reservations and to Native American families residing in designated areas near reservations. The program provides an alternative to the Food Stamp Program for many American Indians who do not have easy access to food stores. Participants receive a monthly food package weighing about 50-75 pounds and containing a variety of foods selected to meet their health needs and preferences. Program eligibility is based on a person's household income, assets, and proximity to a reservation.

The *Nutrition Services Incentive Program* (formerly known as the Nutrition Program for the Elderly) provides cash and commodities to States for meals served in senior citizen centers or delivered by meals-on-wheels programs. Although the program is administered by the U.S. Department of Health and Human Services, it receives commodity foods and financial support from USDA. Eligibility for the program is not based on income; all people age 60 or older and their spouses are eligible for the program.

The *Disaster Feeding Program* is administered by the Federal Emergency Management Agency, which

is responsible for coordinating disaster relief. Under this program, USDA provides food commodities for assistance. The program provides food to people living in areas stricken by major disasters or emergencies when other food supplies are not readily available.

The *Emergency Food Assistance Program (TEFAP)*, which began as a cheese-giveaway program in 1982, was implemented as a way to reduce inventories and storage costs of surplus commodities through distribution to needy households. Since 1989, Congress has appropriated funds to purchase additional commodities specifically for this program. USDA buys the food, processes and packages it, and ships it to the States. USDA allocates commodities and administrative funds to States based on a formula that considers the number of people below the poverty level in each State and the number unemployed. Within broad guidelines, each State sets its own eligibility criteria and selects local emergency feeding organizations (including soup kitchens, food recovery organizations, and food banks) to distribute the food.

Under the food distribution programs for *Charitable Institutions and Summer Camps*, USDA donates food to nonprofit charitable institutions serving meals on a regular basis to needy persons and to summer camps for children. These institutions include orphanages, soup kitchens, temporary shelters, homes for the elderly, and church-operated community kitchens for the homeless. (Summer camps participating in the Summer Food Service Program are not eligible to receive commodities through this program.) The amount of food donated each year depends on the amount of surplus and price-support commodities available.

participation, which picked up speed during the second half of the fiscal year, was attributable largely to the Nation's worsening economic conditions.

Average food stamp benefits per person increased 3 percent, from \$72.77 in fiscal 2000 to \$74.77 in 2001. Expenditures for the program totaled \$17.7 billion in fiscal 2001, or 4 percent more than the previous year (table 1). This increase was the first in food stamp expenditures since 1995.

Because Food Stamp Program standards and criteria may not be suitable in outlying areas, such as U.S. Territories, USDA provides block grants to Puerto Rico, American Samoa, and the Commonwealth of the Northern Mariana Islands to operate separate nutrition assistance programs. Funding for these Nutrition Assistance Block Grant Programs is limited to an annual amount specified by law, unlike funding for the Food Stamp

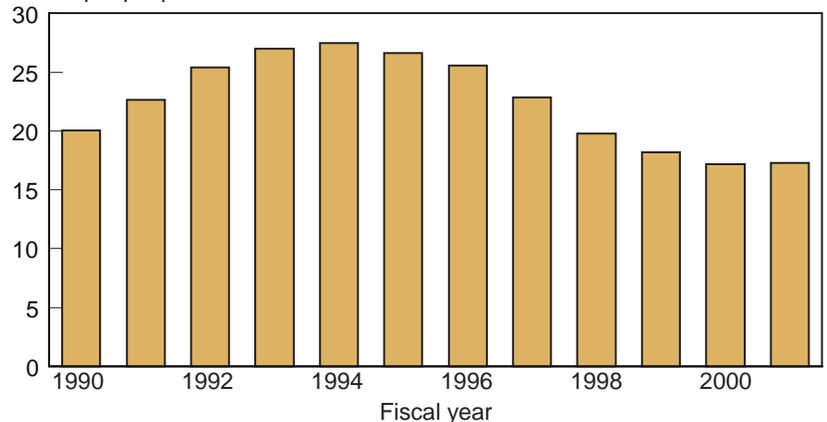
Program, which can expand or contract as more or fewer people become eligible. Combined expenditures for these three block grant programs totaled \$1.3 billion in fiscal 2001, an increase of 2 percent over fiscal 2000.

## Child Nutrition Programs

The National School Lunch Program is the Nation's second-largest nutrition assistance program, accounting for 19 percent of all USDA nutrition assistance expenditures in fiscal 2001. The program

**Figure 2—Food Stamp Participation Increased in Fiscal 2001 After 6 Consecutive Years of Decline**

Million people per month



Source: USDA's Food and Nutrition Service.

**Table 1—Overall Food Assistance Expenditures Increased 4 Percent in Fiscal 2001**

Food assistance program	Program costs		Change in costs, 2000-01
	2000	2001	
	<i>Million dollars</i>		<i>Percent</i>
Food stamp-related programs	18,335.1	19,009.5	3.7
Food Stamp Program	17,055.7	17,702.2	3.8
Nutrition assistance programs	1,279.4	1,307.3	2.2
Child nutrition programs <sup>1</sup>	9,509.2	9,918.6	4.3
National School Lunch Program	6,148.5	6,454.8	5.0
School Breakfast Program	1,393.4	1,442.4	3.5
Child and Adult Care Food Program	1,683.9	1,733.6	3.0
Summer Food Service Program	268.0	272.3	1.6
Special Milk Program	15.4	15.5	.4
Supplemental food programs	4,065.8	4,235.1	4.2
WIC <sup>2</sup>	3,971.1	4,133.2	4.1
Commodity Supplemental Food Program	94.8	102.0	7.6
Food donation programs	436.4	596.8	36.8
Food Distribution on Indian Reservations	71.7	68.2	-5.0
Nutrition Services Incentive Program <sup>3</sup>	137.1	151.5	10.5
Disaster Feeding Program	.4	.4	-6.5
TEFAP	224.9	370.0	64.5
Charitable Institutions and Summer Camps	2.2	6.9	205.8
All programs <sup>4</sup>	32,622.9	34,032.6	4.3

<sup>1</sup>Total includes the Federal share of State administrative costs, which was \$161.4 million in fiscal 2000 and \$154.2 million in fiscal 2001.

<sup>2</sup>Expenditure data for fiscal 2001 do not include the costs associated with the WIC Farmers' Market Nutrition Program.

<sup>3</sup>Formerly called the Nutrition Program for the Elderly.

<sup>4</sup>Total includes Federal administrative expenses of \$114.9 million in fiscal 2000 and \$118.2 million in fiscal 2001.

Source: USDA, Food and Nutrition Service, Keydata September 2001. Data subject to change with later reporting.

provided nutritious meals in over 98,000 schools and residential child care institutions in fiscal 2001. Almost 28 million children, or about 57 percent of the children attending these schools and institutions, participated in the program each schoolday.

A total of 4.6 billion lunches were served under the National School Lunch Program in fiscal 2001, slightly less than in fiscal 2000. As in fiscal 2000, about 48 percent of these meals were provided free to students and another 9 percent were provided at a reduced price. The remaining 43 percent were full-price meals, though USDA subsidizes even these full-price meals to some extent. Expenditures for the program totaled almost \$6.5 billion in fiscal 2001, or about 5 percent more than in fiscal 2000.

The School Breakfast Program is much smaller than the National School Lunch Program, serving about 7.8 million children each schoolday, or about 21 percent of the children attending one of the almost 75,000 participating schools or institutions in fiscal 2001. The program also served a larger percentage of low-income children than the National School Lunch Program—75 percent of all breakfasts served in the program were free, and another 8 percent were provided at a reduced price in fiscal 2001.

Over 1.3 billion breakfasts were served in fiscal 2001, or 2 percent more than in fiscal 2000. Unlike the National School Lunch Program, in which the number of meals served decreased in fiscal 2001, the School Breakfast Program is still expanding in terms of total meals served, although the rate of growth is far less than during the early 1990s when schools were joining the program at a faster rate (fig. 3). Expenditures for the School Breakfast Program totaled \$1.4 billion, or almost 4 percent more than in fiscal 2000.

Almost 1.7 billion meals were served under the Child and Adult Care Food Program in fiscal 2001,

of which 55 percent were in child care centers, 43 percent in day care homes, and 2 percent in adult care centers. The number of meals served under the program in fiscal 2001 increased 11 percent in adult care centers and 2 percent in child care centers. The number of meals served in day care homes declined 3 percent, continuing a downward trend since welfare reform legislation in 1996 reduced the reimbursement rate structure for homes not located in low-income areas or operated by low-income providers. Program costs totaled about \$1.7 billion in fiscal 2001, or 3 percent more than in fiscal 2000.

In fiscal 2001, almost 133 million meals were served in the Summer Food Service Program, or about the same number as in fiscal 2000. During the peak month of July, an average of 2.1 million children at over 31,000 sites across the country participated in the program daily. All meals under this program are served free. Program costs totaled almost \$272 million in fiscal 2001, or about 2 percent more than in fiscal 2000.

Expenditures for the Special Milk Program totaled \$15.5 million in fiscal 2001, or about the same as in fiscal 2000. However, the number of half pints of milk served under this program in fiscal 2001 totaled 116 million, or 3 percent less than in the previous fiscal year. The number of half pints served in the program has decreased in each of the past 13 years. Schools continue to leave the Special Milk Program as they participate in the National School Lunch Program and the School Breakfast Program, which include milk with their meals.

### Supplemental Food Programs

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is the third-largest nutrition assistance program in terms of expenditures, trailing only the Food Stamp Program and the National School Lunch Program. After 3 years of relatively stable levels, expendi-



The National School Lunch Program serves nutritious meals in over 98,000 schools and child care institutions. About 28 million children take part in the program each schoolday.

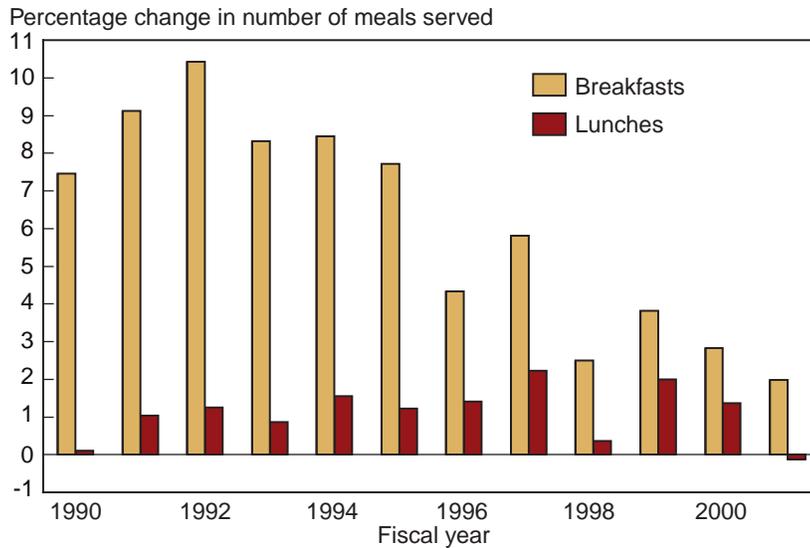
Credit: USDA.

tures for WIC increased 4 percent in fiscal 2001 to \$4.1 billion.

An average of 7.3 million people per month participated in WIC in fiscal 2001, of whom 49 percent were children, 26 percent were infants, and 24 percent were women. After decreasing slightly in each of the last 3 fiscal years, the number of participants in the program increased almost 2 percent in fiscal 2001. The average monthly WIC food cost per person in fiscal 2001 was \$34.20, or 4 percent greater than in fiscal 2000.

Like the much larger WIC program, the Commodity Supplemental Food Program provides supplemental foods to low-income women, infants, and children. Unlike WIC, however, the Commodity Supplemental Food Program also serves elderly persons (age 60 and older). Over the last decade, participation

**Figure 3—Increases in School Breakfasts Served Slowed Down After Fiscal 1992**



Source: USDA's Food and Nutrition Service.

in the program has been shifting to the elderly. About 407,000 persons per month participated in the program in fiscal 2001, or about 5 percent more than during fiscal 2000. The number of elderly participants increased 10 percent in fiscal 2001, while the number of women, infants, and children participating in the program decreased 12 percent. This participation pattern continues the trend of eligible women and their children joining WIC rather than the Commodity Supplemental Food Program. Elderly persons accounted for 79 percent of all participants in the program in fiscal 2001, compared with only 39 percent in fiscal 1990. Expenditures for the program totaled \$102 million in fiscal 2001, almost 8 percent more than in fiscal 2000.

### Food Donation Programs

Although U.S. food donation programs as a group experienced the greatest percentage increase in expenditures in fiscal 2001—37 percent—they still account for only 2 percent of all expenditures for food assistance. On average, 113,000 people per month participated in the Food Distribution Program on Indian Reservations in fiscal 2001, or about 7 percent less than in fiscal 2000. This drop

marked the second straight year in which program participation decreased. Cost of the program totaled \$68 million in fiscal 2001, a decrease of 5 percent from fiscal 2000.

In November 2000, the Older Americans Act of 2000 changed the name of the Nutrition Program for the Elderly to the Nutrition Services Incentive Program. Although administered by the U.S. Department of Health and Human Services, the program receives commodity foods and cash support from USDA. In fiscal 2001, the program served 252 million meals, about the same as in fiscal 2000. The Act also made changes to the system of allocating USDA cash funds to the program. Total program costs to USDA totaled \$152 million in fiscal 2001, or 11 percent more than in fiscal 2000.

The Emergency Food Assistance Program (or TEFAP), the largest of the food donation programs, provides low-income Americans with emergency food and nutrition assistance, usually distributed via soup kitchens and food pantries. Expenditures for TEFAP totaled \$370 million in fiscal 2001, an increase of almost 65 percent from fiscal 2000. Combined expenditures for the food distribution programs

for Charitable Institutions and Summer Camps totaled almost \$7.0 million in fiscal 2001, up from \$2.2 million in fiscal 2000. The large percentage increases in expenditures in TEFAP and the programs targeting charitable institutions and summer camps was the result of large increases in the amount of USDA surplus commodities made available to States.

Expenditures for the Disaster Feeding Program totaled \$0.4 million in both fiscal 2000 and 2001.

### Economic Conditions Will Determine Future Food Assistance Expenditures

Expenditures for the Food Stamp Program dominate total expenditures for Federal food assistance. However, the Food Stamp Program's share of total food assistance expenditures has decreased in recent years, from 68 percent in fiscal 1992 to 52 percent in fiscal 2001. This decrease corresponded to the strong economy: from early 1991 to early 2001, the United States enjoyed its longest period of economic expansion in its history. However, March 2001 signaled the beginning of a recessionary period, defined as a significant decline in activity spread across the economy, lasting more than a few months.

Since participation in the Food Stamp Program is inversely related to economic conditions (that is, participation increases as the economy worsens), if a recession is lengthy, it is likely to increase participation in the Food Stamp Program. In turn, an increase in participation in the Food Stamp Program would lead to an overall increase in food assistance expenditures. Other programs might be affected as well if more people sought food assistance as a result of declining incomes from lost jobs or lower wages.

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U.S. Department of Agriculture, Food and Nutrition Service, Budget Division. *Program Information Report (Keydata), U.S. Summary, September 2001*, November 2001. **FR**

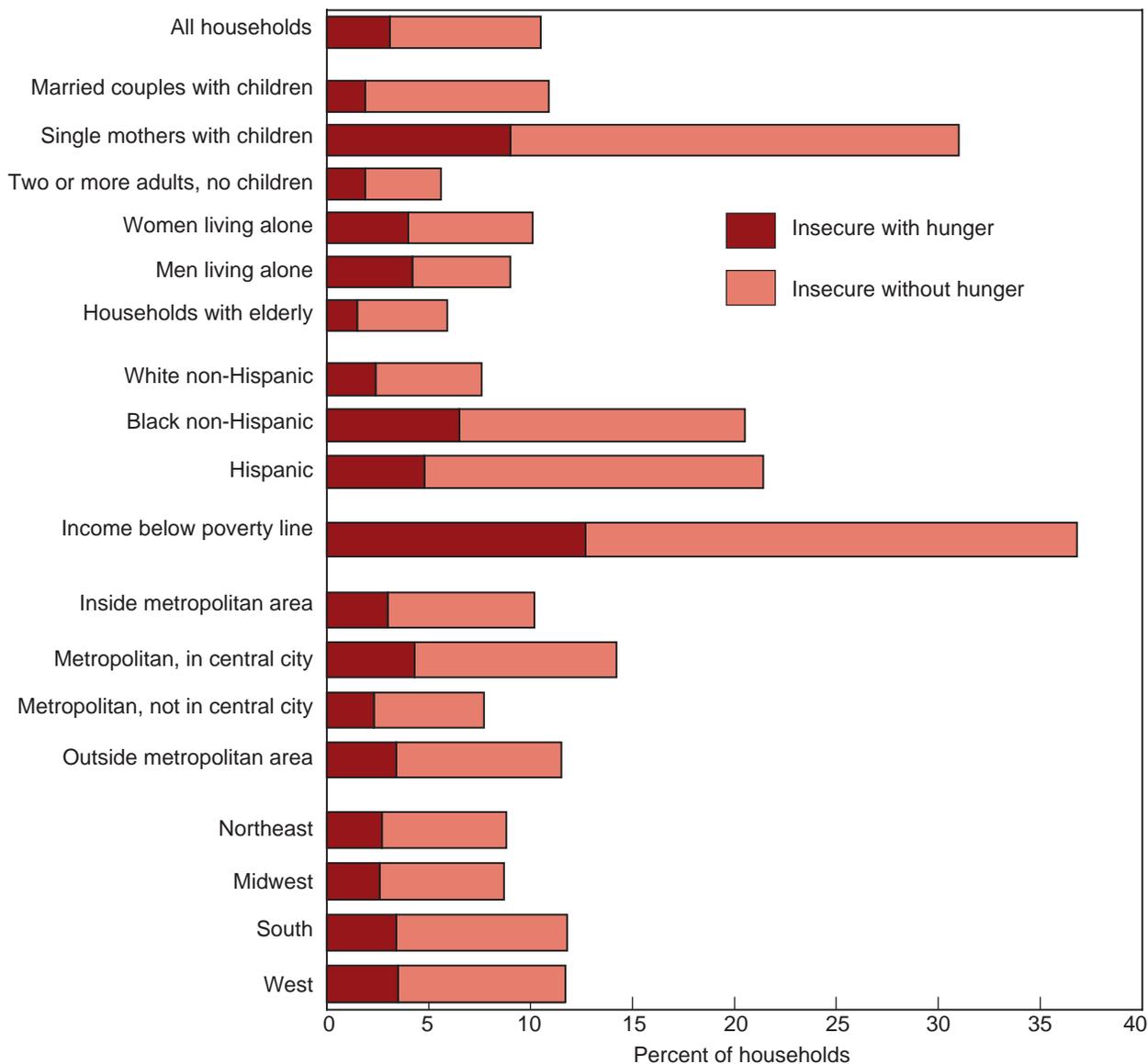
# ERS Releases New Report, *Household Food Security in the United States, 2000*

According to a new report released by USDA's Economic Research Service (ERS), food security—access by all people at all times to enough food for an active,

healthy life—improved significantly in the United States from 1998 to 2000. The prevalence of food insecurity fell 11.3 percent and the prevalence of hunger fell 15.6 per-

cent. (Comparisons are made with 1998 rather than 1999 because data were collected in a different season in 1999.) The declines were widespread across a range of

**Figure 1—Prevalence of Food Insecurity and Hunger, 2000**



Source: Prepared by ERS based on data from the September 2000 Current Population Survey Food Security Supplement.

demographics, including households of all compositions except elderly persons living alone, all racial/ethnic groups, and all geographic areas except nonmetropolitan areas.

USDA monitors food security through an annual survey of some 40,000 U.S. households, conducted as a supplement to the U.S. Census Bureau's nationally representative Current Population Survey. The most recent food security survey reveals that 89.5 percent of U.S. households were food secure throughout the year ending in September 2000. These households had access, at all times, to enough food for an active, healthy life for all household members. The remaining 10.5 percent of U.S. households (11 million) were food insecure. At some time during the previous year, these households were uncertain of having, or unable to acquire, enough food to meet basic needs of all household members because they had insufficient money or other resources.

In about one-third of food-insecure households (3.3 million, or 3.1 percent of all U.S. households), one or more household members were hungry at least some time during

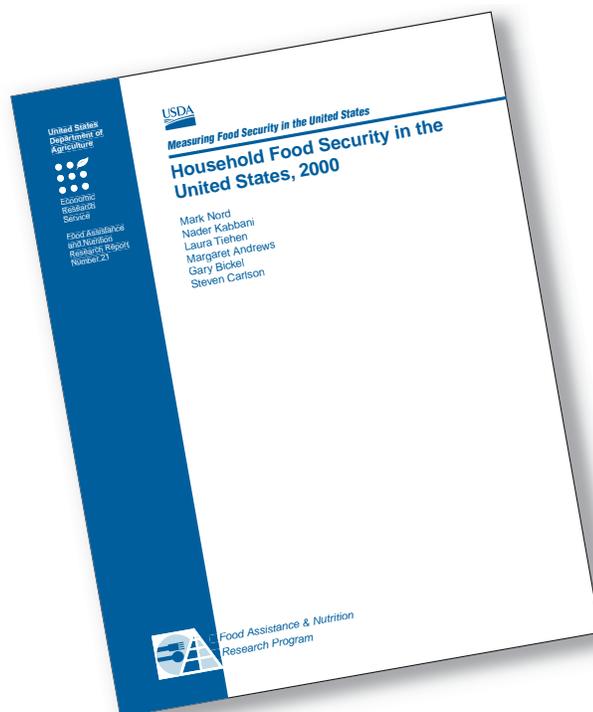
the year because they could not afford enough food. The other two-thirds of food-insecure households obtained enough food to avoid hunger by using a variety of coping strategies, such as eating less-varied diets, participating in Federal food assistance programs, or getting emergency food from community food pantries.

Single mothers with children had the highest levels of food stress in 2000; 31 percent of these households were food insecure and 9 percent were food insecure with hunger (fig. 1). Black and Hispanic households also had rates of food insecurity and hunger above the national average. In U.S. households, children—especially younger children—are usually protected from hunger unless hunger among adults reaches quite severe levels. Even so, in about 255,000 households (0.7 percent of households with children), one or more children were hungry at some time during the year because the household could not afford enough food.

To provide additional insight into the nature of food insecurity and how low-income households meet their food needs, the 2000 food security report was expanded

to include information on household food spending and how food-insecure households used Federal food assistance programs and community food pantries and emergency kitchens. The survey found that, on average, food-insecure households spent 26 percent less on food than food-secure households of the same size and age composition. Among food-insecure households:

- 50.4 percent received help from one or more of the three largest Federal food assistance programs during the month before the survey (23 percent received food stamps, 32 percent received free or reduced-price lunches for children, and 14 percent received benefits from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC);
- 16.7 percent obtained emergency food from a food pantry, church, or food bank during the 12 months before the survey; and
- 2.5 percent had members who ate at an emergency kitchen some time during the 12 months before the survey. **FR**



***Household Food Security in the United States, 2000***, FANRR No. 21, can be accessed through ERS's Web site at [www.ers.usda.gov/publications/fanrr21/](http://www.ers.usda.gov/publications/fanrr21/). Printed copies of the report can be purchased by calling 1-800-999-6779 (weekdays, 8:30-5:00 ET) to charge your order to American Express, Visa, or MasterCard (callers outside the United States, please dial 703-605-6220). Or, order by mail from ERS-NASS, 5285 Port Royal Road, Springfield, VA, 22161. Make your check or money order payable to ERS-NASS. Please include your complete address and day-time telephone number.

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